

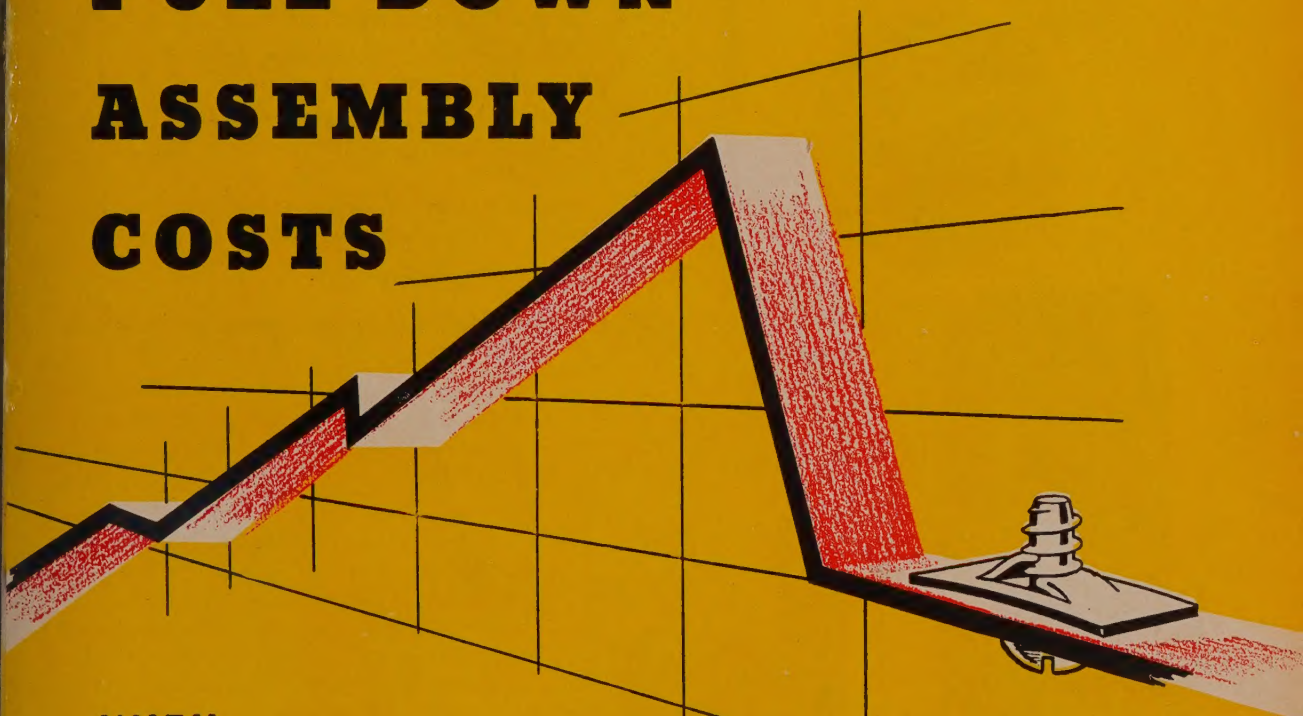
STEEL

The Magazine of Metalworking and Metalproducing

CONTENTS — PAGE 39

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Speed Nuts[®]

FASTEST THING



IN FASTENINGS

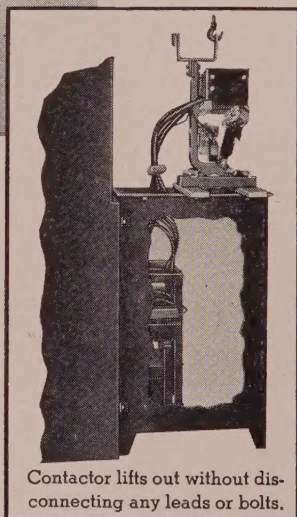
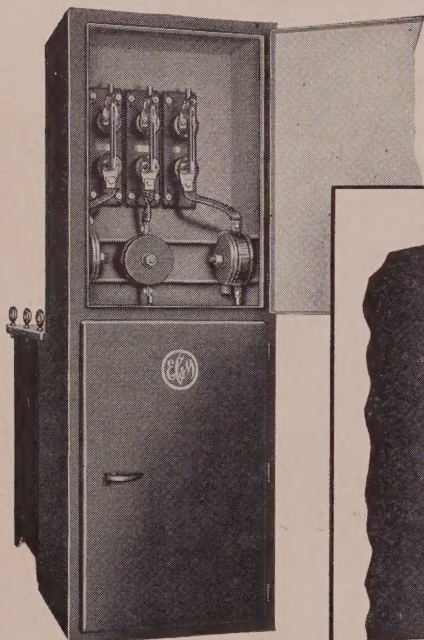


Proof of the remarkable assembly savings possible with Tinnerman SPEED NUTS lies behind these headlines . . . "How Worthington Saves 30% in Assembly Time" . . . "Bendix Saves 8 Ways with SPEED NUTS" . . . "Saved \$50,000 in equipment Investment". They appear in the series of advertisements identified by the booklet shown at left. Watch for new SPEED NUTS Savings Stories appearing regularly in this and other leading publications. Tinnerman Products, Inc., Cleveland 13, Ohio.

*Trade Mark Reg. U. S. Pat. Off.

2300-4600 VOLT MOTOR SHORT CIRCUIT PROTECTION SIMPLIFIED

UNLIMITED
PROTECTION
AT ONE COST



Contactor lifts out without disconnecting any leads or bolts.

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1. Eliminate calculation of available KVA.
2. Prevent future revisions as KVA grows.
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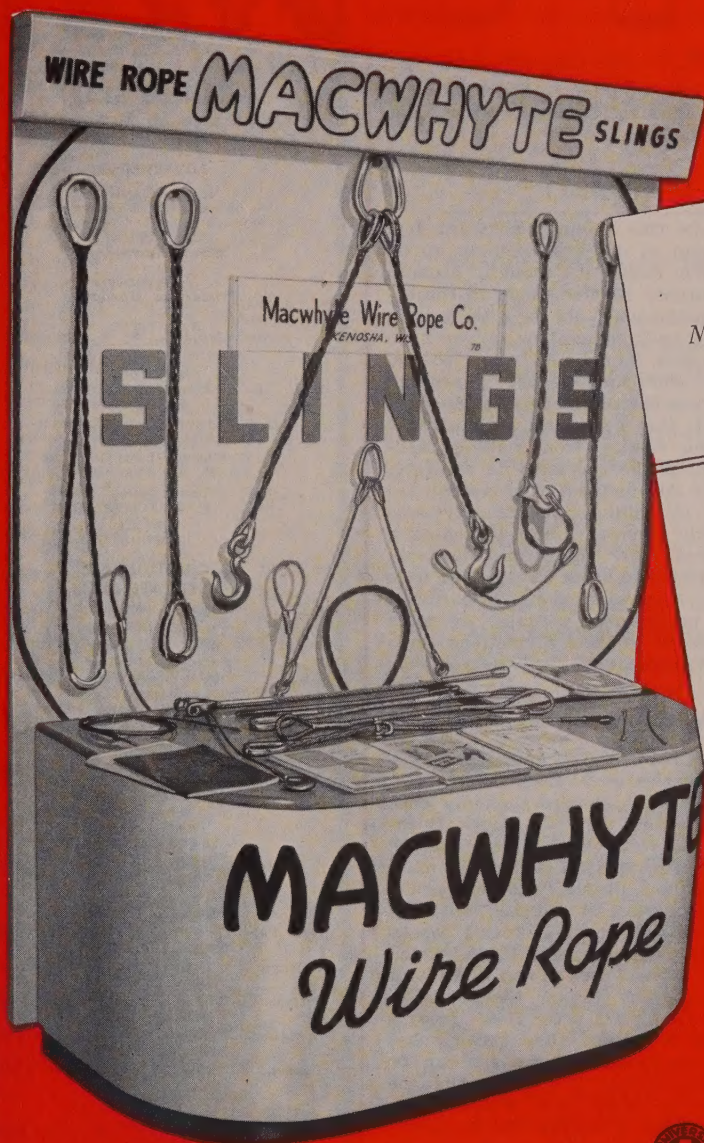
Send only name-plate data of your motors for complete information on EC&M VALIMITOR Starters.

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2300 Volts		4600 Volts
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SAFETY DIRECTOR

Memo to:
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Purchasing Agent

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There's a Macwhyte Sling that's the right sling for any load.

NO. 853-S

Behind the Scenes...

Back Fifty Years

Now that we've been in existence for 10, these many years, perhaps we should go back like the comic strip artists do and rerun old strips, on the theory that there are only a few of us left who have read them all, so they're mostly new anyhow. We were commenting on that the other day when the boss suggested that we might be able to save a little money in make-up if we were to run the same market pages in the back of the book which we ran ten years ago. Imagine your consternation, if you were a purchasing agent, and opened STEEL next Monday to find that the price of No. 1 heavy melting steel Pittsburgh was around \$17 per ton! Or, worse than that, to note that the steel operating rate had suddenly dropped about 40 points! We hope that it is a long, long time before we get back to that state. We've been conditioned by looking at the first few snowflakes in what will shortly become a blizzard—the advance reports from the 1947 Census of Manufacturers, now rolling off the government presses. The last census, of course, was in 1939—and a decade ago things were indeed different. Most of the early industry reports show about 100% increases over that year. Our point in mentioning this, of course, is to remind you that this material is becoming available—that it will be the new “bench mark” for industry, and that you can get copies by writing to the Bureau of the Census, Industry Division, Washington 25 D. C. and asking for a list of the census reports, from which you can order the ones you want.

Whither the Weather?

There really isn't much use talking about anything but the weather these days. It's been a long fall, here on the shores of Lake Erie. Looking out over the beautiful blue water, basking in the bright sunshine, we are tempted to throw the typewriter over in the corner under the steam pipes and take off in a row boat to Canada. However, just in time we remind ourselves that a lot of you readers can't see the postman for the snow piled outside your windows and even in sunny Cal there isn't any sun these days, so in deference to your normal feelings of love for your own home bailiwick we'll not bother to write a lot of winter resort copy. Fact is, we're sitting around with our fingers crossed. December was so nice that we expected

the worst in January, then February, and now March. Maybe we'll have icicles in June.

Back Ten Years

Maybe this looking backward deal is a sign of old age creeping up on us. We doubt it, though, because our purpose isn't so much in conjuring up the good old days as it is in looking back to see how far we have progressed. Sometimes it isn't so far, either. For example, fifty years ago this week the editors of this paper reflected the pessimism in industry that no further iron making facilities would be necessary in the foreseeable future; that the present capacity (15 million tons annually) was not only adequate but represented a practical limit. The future was probably just as cloudy in 1899 as it is today. Men were more foolhardy in their predictions, perhaps, or more courageous in their convictions, however wrong.

Puzzle Corner

Some readers even appreciate these easy puzzles we've been dishing out. Confidentially, they're the only ones we can work ourselves. Buck Buchwald of New York, for example, writes in to applaud, asking for more “all brains” puzzles and no “pencil work” puzzles. He figured out that the original license of two weeks back, for instance, was 10968—which it was. Here's one you can do without a pencil, and par for the course is 15 seconds. All set? How deep is a well, if a rope that just reaches from the bottom to the top can be wrapped exactly 12 times around the cylindrical drum of a windlass, the drum being 7 inches in diameter? Actually, it's possible to do that one from scratch in 5 seconds. After you have the answer, try it again.

Did You Get Yours?

This week we can honestly say that all reader certificates have been mailed—and we hope received—by those of you who have requested them. We even have some more, too. If you would like written evidence of your membership in our gang of people who waste a little time each week reading this column, drop us a line—we'll send you a copy.

Shradu

(Editorial Index—page 39)

STEEL

Vol. 124—No. 9

February 28, 1949

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Business Staff on Page 4

NEXT WEEK...

Carbon Correction
For Steel Bars
Handling Ingenuities Reduce
Casting Production Costs
What is a
Fair Day's Work?
Production of
Tool Steel—Part II

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 124, NO. 9

FEBRUARY 28, 1949

NEWS

★ As the Editor Views the News	41
★ News Summary	45
Demand Slips from Postwar Peak	47
Fourth Round Pay Rise Rejected by GE	49
CIO Opposes Johnson Pricing Bill	50
Reuther Housing Plan Calls for Use of Aircraft Plants	50
Industry Studies Effects of Cities' War on Air Pollution	51
★ Calendar of Meetings	51
Europe Watches U.S. Prices	52
Steel Exports Drop 34 Per Cent in 1948	52
ERP Tool Sales Weak, Bryant of NMTBA Says	53
★ Windows of Washington	54
Where Does Finished Steel Go?	56
Steel Distribution by Geographic Areas	57
Combined Shipments of Steel Products by Geographic Areas	59
★ Mirrors of Motordom	61
International Detrola's Activity Changes	64
★ Briefs	65
★ The Business Trend	66
★ Men of Industry	68
★ Obituaries	73
★ Construction and Enterprise	148

TECHNICAL

★ Engineering News at a Glance	75
Forming, Welding Operations Key Tank Fabrication Factors	76
Off-the-Shelf Service Speeds Replacement Parts Shipments	80
★ Seen and Heard in the Machinery Field	83
Special Indexing Fixture Doubles Small Part Broaching Rate	84
How To Avoid Watermarks on Aluminum	86
Crucible Completes \$3,200,000 Plant Improvement Program	90
★ Progress in Steelmaking—Production of Tool Steel—Part I	102
★ New Products and Equipment	113
★ Helpful Literature	123

MARKETS

★ Market Summary	125
★ Market Prices and Composites	126
Metal Price Tone Remains Firm	130
★ Index to Advertisers	156

Editorial Index available semiannually; STEEL also is indexed regularly by Engineering Index Inc., 29 West 39th St., New York 18

★ Denotes Regular Features.

IN 8 COUNTRIES THE WORLD OVER

56 MORGAN MERCHANT MILLS

roll out high tonnages,
accurately, at low cost

Higher production, greater accuracy, and lower cost per ton is the three-fold objective of every mill we build.

There is no standard Morgan mill. Each is engineered and built to meet specific needs. And we believe each mill is more efficient and better adapted to the circumstances than its predecessor.

Producers the world over have found it profitable to come to Worcester for their rolling mill equipment. If your plans call for rolling merchant shapes, we believe it will pay you to talk with our engineers.

MORGAN CONSTRUCTION COMPANY

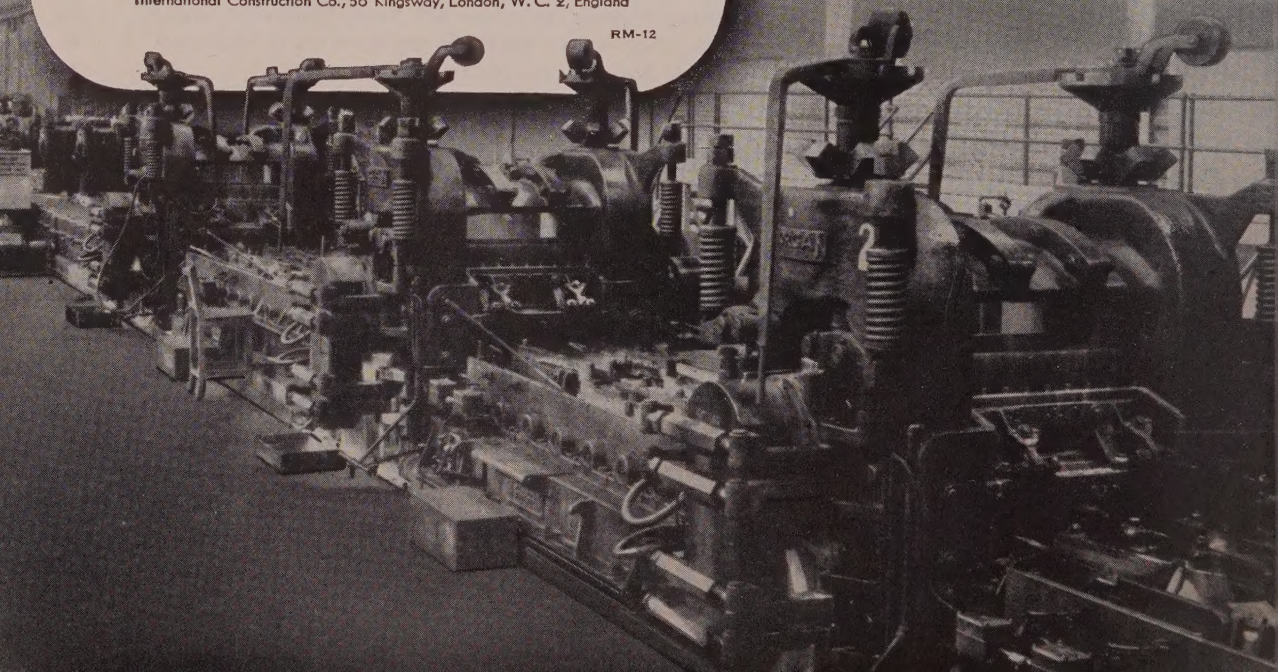
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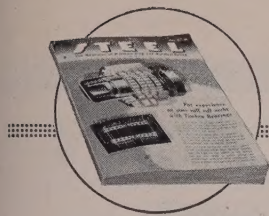
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Regenerative Furnace Control - Air Ejectors

English Representative:

International Construction Co., 56 Kingsway, London, W. C. 2, England

RM-12





February 28, 1949

Honeymoon Is Over

Reports from Washington indicate that the honeymoon of the Truman "fair deal" is over. Gone is the hope that the principal promises which Mr. Truman made in his campaign speeches would be kept by rushing through legislation in the early months of the new session of Congress. Practically every law which the President has recommended to repay his fancied debt to labor or other supporters is being held up for careful consideration.

A case in point is the new labor law. The administration has bungled the handling of testimony favoring the ditching of the Taft-Hartley act and returning to the one-sided Wagner act. Today it is doubtful whether a labor law will be enacted before May 1, yet the administration and the union chiefs once had hopes that a law suitable to them would be rushed through by early March. Also, it is becoming evident that numerous provisions of the Taft-Hartley act will be incorporated in the 1949 law.

Another point on which President Truman has been emphatic is higher taxes. Yet influential Senator George, chairman of the Senate Finance Committee, says positively that "this is no time to increase taxes." Robert L. Doughton, chairman of the House Ways and Means Committee, and many other prominent Democrats in both houses are extremely dubious about increasing taxes under existing conditions.

Also, there is reluctance in varying degree among members of both parties to accept wholeheartedly many of Mr. Truman's other proposals. In fact, evidence is mounting daily to indicate that we may witness in a few months an 81st Congress—even with its Democratic majority—which is almost as much at odds with Mr. Truman's program as was the 80th Congress, which Candidate Truman characterized during last year's political campaign as one of the "worst" in the history of the nation.

Thus there is a possibility that Mr. Truman, in sticking obstinately to a program unsuited to present conditions, will weaken his position to the point where Congress can save the nation from some of the more dangerous of his proposals. He has said enough to indicate that he is bent upon leading the nation recklessly down the road to socialism. Now is the time to head him off.

* * *

WHERE THE STEEL GOES: In investigating the distribution of steel from the standpoint of the needs of small consumers, the Martin subcommittee last fall questionnaired 14 large steel producers as to shipments of 11 steel products by geographical areas. From returns received, the committee compiled distribution in tons for 1940 and 1947 for each state and for a number of sub-state consuming areas. The data cover hot and cold-rolled sheets and strip; hot-rolled and cold-finished bars; butt-weld, lap-weld and seamless pipe; and electrically welded and mechanical tubing. Some important prod-

ucts such as plates, shapes and wire are not included.

The committee compiled these figures to determine the extent to which the pattern of distribution in 1947 differed from that of 1940. Some shifts are revealed, but most students of the fascinating subject of steel distribution will consider these incidental to the fact that the figures go part way in supplying long-awaited information on the geographical consumption of steel.

It is interesting to know that in 1947 the leading recipients of the 11 steel products, in order of tonnage, were Michigan, Ohio, Pennsyl-

(OVER)

AS THE EDITOR VIEWS THE NEWS

vania, Illinois, New York, Indiana, Texas, California, Wisconsin, New Jersey, Massachusetts and West Virginia. These 12 states accounted for 85 per cent of total shipments. Michigan alone accounted for 21 per cent, which is near the figure traditionally attributed to the automotive industry.

We hope this report will stimulate interest in more complete statistics on where steel goes.

—pp. 56, 59

* * *

BACKLOGS ARE FADING: Since Jan. 1 of this year, American steel producers have been turning out steel ingots at an unprecedented annual rate of more than 95 million tons annually. During the same period automobile manufacturers in the United States and Canada have been assembling passenger cars and trucks at an annual rate of more than 5.8 million units.

Eight weeks of sustained output at these levels, following high production throughout most of 1948, is rapidly bringing supply and demand for cars and steel into better balance. Backlogs of orders for motor cars, which looked tremendous only a few months ago, have dwindled to moderate proportions for most models. Now there are signs that the large back-up orders for steel are undergoing a somewhat similar contraction.

Some consumers still complain about the difficulty of obtaining steel, but an increasing number report a decided improvement in supply. The trend toward a buyers' market is unmistakable.

—pp. 47, 61, 125

* * *

SERVICE TO CUSTOMERS: Sometimes one wonders whether the problem of supplying renewal and repair parts to customers receives the amount of attention on the part of equipment builders and manufacturers that it deserves. Certainly the customer who has invested considerable money in an important machine or piece of equipment has a right to expect prompt service when he needs repairs or replacements.

One manufacturer—Reliance Electric & Engineering Co.—has considered this problem important enough to warrant the inauguration of an "off-the-shelf service" on renewal parts. It has gone into the details of inventory, packaging, shipment and paper work thoroughly. The tangible results are readily apparent in the efficiency with which orders for renewal parts are handled. A less tangible but even more important advantage is that of customer good will,

which is reflected in repeat orders for major equipment.

—p. 80

* * *

A WELCOME NEIGHBOR?: Every now and then anyone who visits the larger cities periodically is informed by headlines in the local papers that an anti-smoke campaign is on. Often the accompanying story lists a number of offenders, including industrial firms. This is not surprising, because studies of air pollution indicate that the sources of trouble are: Industrial plants and railroads, 60 per cent; commercial buildings, 15 per cent; and homes and apartment buildings, 25 per cent.

Because industry rates high as a source of air pollution, the editors of this publication queried a number of municipalities as to their programs for controlling excessive smoke and fumes. Of 29 industrial communities responding, 26 reported that they are strengthening their regulations. Most of the officials commented that the co-operation of industry in combatting air pollution is excellent.

This is encouraging. Being a welcome neighbor in a community is one of the primary essentials of public relations for any industrial enterprise.

—p. 51

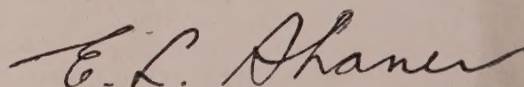
* * *

PRODUCT IS UNIFORM: Fourth in the series of articles on the fundamentals of steelmaking appearing in this publication is a treatise on the production of tool steel by George A. Roberts, chief metallurgist of Vanadium-Alloys Steel Co.

The manufacture of tool steel is a distinct specialty. Unlike carbon steels, tool steels practically are tailor-made. Over 90 per cent of the tool steel produced in America is melted in basic electric furnaces. Lesser amounts are melted in coreless induction furnaces and in basic open hearths. At the present time no American tool steel producers are operating the one-time popular crucible melting furnaces.

While the fundamental operations in the manufacture of tool steels are fairly simple, the variations in practice introduced by numerous competitors are many and complex. In spite of the diversity of practices as to detail, American manufacturers have done an outstanding job in maintaining a uniformity of product which is important to the consumer.

—p. 102



EDITOR-IN-CHIEF

URGENCY FADING—Evidence that the national economy is moving toward a plateau somewhat below the peak postwar levels but well above those of prewar accumulates week by week (p. 47). Much of the urgent demand for goods, regardless of price or exact specifications, has disappeared and buyers have become more cautious pricewise. Few items remain in the sellers' market category and premium prices are fading from the picture. Popular light autos are reported available for immediate delivery in some areas. A majority of steel users find material easier to obtain, although a balance in supply and demand has not yet been reached and some consumers still are unable to obtain adequate tonnage. Delivery time on most heavy equipment has been shortened appreciably, and many hard goods items are in surplus supply at present prices.

LABOR REBUFFED—First major setback to organized labor's demands for a fourth-round wage increase came from a leading electrical manufacturer which turned thumbs down on demands for more money and liberalized insurance and pension program (p. 49). Unions, of course, will continue to press their demands, with most of the larger units stressing social security benefits over rate increases. An exception is the United Rubber Workers which places primary emphasis on its demand for a 25-cent hourly rate advance. . . . Meanwhile, the unions appear to be losing ground in their battle for re-enactment of the Wagner act . . . Hearings on a proposal to raise minimum steel wages under the Walsh-Healey act started in Washington last week.

DISTRIBUTION PATTERN—An important by-product of the Martin Committee survey of steel distribution policies is a partial picture of where steel goes—by geographical areas (pp. 56-59). Although some important products are not included in the picture, the data will be interesting and useful to metalworking companies.

AIR POLLUTION—Control of smoke and fumes in industrial areas increasingly is being recognized as a serious problem and many communities (p. 51) are undertaking vigorous programs to abate the nuisance or, at times, danger. Industry in some cases has taken the initiative, recognizing the benefits that will accrue in better community relations from cleaning up the air.

U. S. IN BUSINESS—Believers in the private enterprise system are disturbed by the implications of the national administration's proposal to put the government in business through investment of public funds (p. 54). They believe that if the President's request is granted in connection with steel, the country will be fairly launched on the road toward socialization.

WHOSE TOOLS?—American machine tool builders look askance at ECA policy which, they say, subsidizes the building up of European machine tool manufacture while the American industry, vital to national security, is operating at a fraction of capacity. They suggest (p. 53) that Congress should authorize ECA to direct participating nations to include American tools in the requests for allotments.

BONDED BRAKE LININGS—Both Chrysler and Chevrolet are offering bonded brake linings on 1949 passenger cars (p. 61), after thorough testing on earlier truck models. Advantages claimed over riveted linings are larger effective braking areas and longer life.

HERE AND THERE IN INDUSTRY—The Johnson bill to clarify confusion surrounding pricing policies is opposed by the steelworkers' union, which believes the Federal Trade Commission should be free to continue to find a middle ground between basing point and f.o.b. mill pricing systems (p. 50) . . . International Detrola Corp. entered the steel business in 1946 to insure a supply of material for its manufacturing plants. Now steel production is almost half its business and company proposes to change its name to Newport Steel Corp. (p. 64). . . . Price trends in the United States are being watched closely by western European countries which may also be entering a period of disinflation (p. 52).

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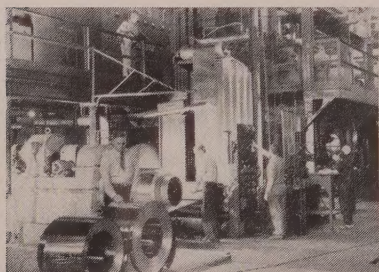
A Progress Report to Its Friends from INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill.

INLAND TO UP STEEL OUTPUT 17%

50% Increase in Tin Mill Products Expected from Modernized Inland Facilities

Inland Steel Company's capacity for producing tin plate and other tin mill products, now estimated at 17,000 tons per month, will, under the program, be increased to approximately 25,000 tons by replacing existing facilities with more efficient equipment.

To meet the need for additional annealing capacity, a new, continuous annealing furnace, designed to handle 30,000-pound coils, will be installed. In addition, a new tandem temper mill that



A new electrolytic tinning line, similar to the one above, will operate at 800 feet per minute and produce 36-inch plate.

will operate at a speed of 3,600 feet per minute is to be built.

Other installations in the planned tin mill improvement program include a new 800-feet-per-minute electrolytic tinning line and a modern high-speed Hallden shear and classifying line.

INLAND ORDERS LARGEST ORE CARRIER ON THE GREAT LAKES

What will be the largest and most up-to-date ore carrier on the Great Lakes is now being built by Inland. The new ship, to be called the "Wilfred Sykes,"



A view of Inland's No. 2 Open Hearth Department, first to be enlarged and strengthened in the company's modernization program.

SHEET AND STRIP MILL IMPROVEMENTS TO NET 240,000 TONS PER YEAR

With a continuing heavy demand for cold-rolled steel sheets, Inland Steel Company is pushing its program to modernize and increase the capacity of its sheet and strip mills. It is nearing completion and will give the company an increased annual capacity of approximately 240,000 tons of cold-rolled products.

The program includes the addition of new buildings, installation of additional finishing equipment, the modernization of existing equipment, and the regrouping of processing facilities.

in honor of Inland's president, will have a capacity of 20,000 gross tons, will be 678 ft. long, 70 ft. wide, and 37 ft. deep, and will travel at 16 m.p.h.

OPEN HEARTH MODERNIZATION TO BOOST INGOT CAPACITY TO 4,000,000 TONS

After several years of extensive engineering preparation, Inland has launched a program to increase its annual ingot-producing capacity over the next two years from the present 3,400,000 tons to 4,000,000 tons—a jump of over 17%.

The increase will be accomplished by enlarging and improving existing open hearth facilities. This will not divert large amounts of steel from consumer use, and will increase steel output quicker than would the construction of new furnaces.

Specific plans in the modernization program involve not only the enlargement of furnaces but also the use of better refractories, expanded use of oxygen for decarburization and flame enrichment, improved charging facilities for all materials, strengthening of the open hearth structures, and installation of heavier equipment, such as cranes and ladles, to handle larger heats. In addition, improved sinter for charge ore, and better-prepared baled scrap will be used.

Inland Installing New Battery of Coke Ovens

A new battery of coke ovens to supply Inland blast furnaces with better fuel is being installed at the Indiana Harbor Plant. Beneficiated coal for the new ovens will come partly from a new coal-washing plant being installed at Inland's Price Mine, Price, Ky.



Demand Slips from Postwar Peak

Business activity shows signs of leveling off on a plateau below the highest pinnacle, but still substantially above prewar levels

HOW'S BUSINESS? No question posed to metalworking executives today provokes more animated discussion or brings forth a wider variety of opinion than this.

Ask the question of a group of executives and a few will insist that backlogs still are large, pressure for deliveries intense and that no weakening is in immediate view. A few will believe the country is heading into a substantial recession. The majority will recognize that a major readjustment is taking place, that sellers' markets have just about disappeared, that cost and price figuring pencils will have to be sharpened, but believe that the economy is entering a level somewhat below the postwar peak, yet well above prewar. More often than not, they believe the readjustment to be a healthy one.

Experiences Vary—These opinions are not whimsical, but result from individual experiences. Seldom has the business picture been so spotty.

This is particularly evident in the varying opinions on the availability of steel. While a majority of users report that steel deliveries are easier and that their inventories are larger and better balanced, a sizable and

outspoken minority finds steel supplies still are extremely tight.

One large metalworking company told STEEL last week that its operations had been cut from 100 per cent of capacity in December to 65 per cent at present and that its products still are piling up. This company first discontinued conversion steel purchases and lately has canceled its open orders and cut back the tonnage of steel allocated to it by the mills.

Another "blue chip" consumer says steel procurement definitely is easier and that mills voluntarily have offered increases in its steel allocations. Its plants are well stocked and a check by the company's steel buyer late last week revealed that several large divisions "didn't need a thing" in the way of steel, for the first time in several years.

Situation Spotty—The purchasing executive of a big Midwest appliance manufacturer, whose steel supply is adequate, notes the extreme spottiness of the situation.

"I can take you to plants which are closed for lack of business and which have canceled all their orders for steel. And I can take you into plants where the management is yelling frantically because they can't obtain

enough material to maintain operations at a satisfactory level."

Some plants which have reduced their operations are continuing to take their steel allotments, either adding them to inventory or peddling the material to less well supplied companies.

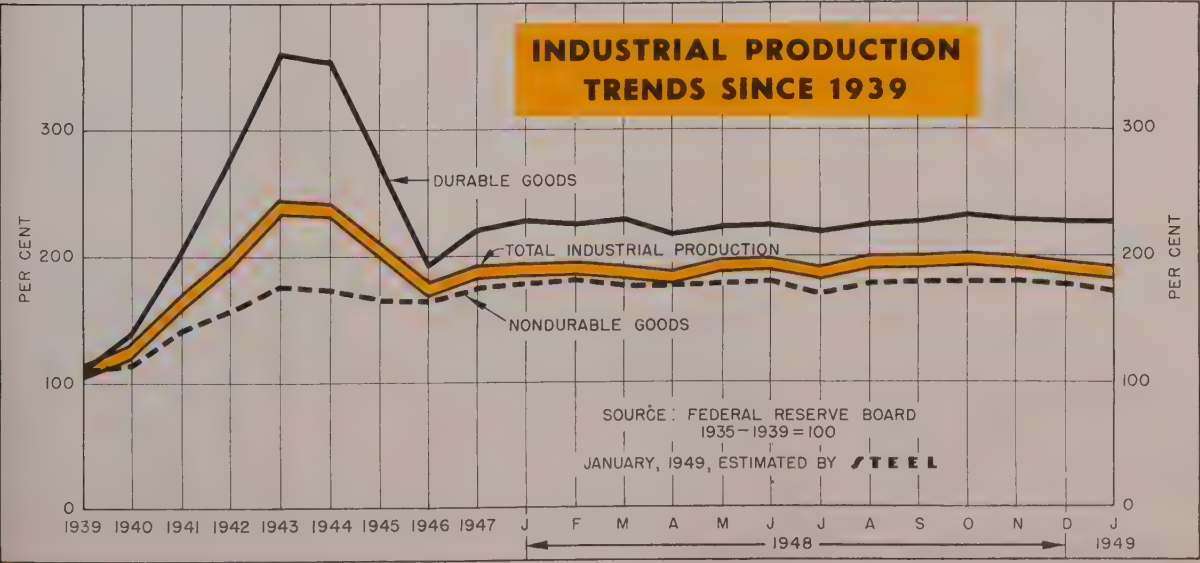
One stove manufacturer is attempting to keep steel flowing to its plants from the mills and at the same time maintain its plant operations by offering to supply the steel and fabricate it in its own plant to whoever wants to buy.

The Other Side—A Detroit tubing manufacturer finds obtaining steel "just as difficult as ever." A Kentucky metalworking firm says its steel supply is as precarious as at any time since the plant started. A Milwaukee manufacturer says, "Just show me where I can buy 5000 tons of sheets."

Mill sales offices generally hold that demand continues pressing, that cancellations and holdup orders are few and that any steel thus freed is eagerly taken by other buyers. However, one producer privately doubts that the industry will sell all the steel it could produce in the first half.

Gray Market Fading—Operators in the irregular market are finding the going increasingly tough. Prices have tumbled sharply. One Ohio operator last week offered 2600 tons of cold and hot-rolled sheet in wanted sizes and gages and a sizable tonnage of enameling sheet, "all or any part at 8¼ cents a pound."

As the supply eases, buyers are shying away from premium priced-



steel, first from the gray market brokers, then from conversion steel. Several important buyers of conversion steel either have discontinued buying this material or are reducing such purchases.

Steel consumers who bought hand mills to insure their source of steel supply a year or two ago are giving serious thought to the cost of steel thus obtained. As the steel supply eases, some of these mills are expected to be closed.

Premium Prices Fading

PREMIUM prices for pig iron and steel products have been lowered by several producers within the past few weeks.

Lone Star Steel Co., Lone Star, Tex., has reduced pig iron from \$75 to \$50.50 for No. 2 foundry iron, low phosphorous southern grade, and is quoting basic at \$50. The foundry iron price compares with \$46.50 at major producing centers. The Lone Star furnace will change over to production of basic iron after a sufficient stock of foundry iron is built up to protect the company's foundry customers.

Kaiser Co. Inc. has reduced basic iron at Ironton, Utah, from \$62 to \$55, and No. 2 foundry from \$62.50 to \$55.50.

Keystone Steel & Wire Co. has cut wire and wire product prices \$4 to \$7 a ton.

Follansbee Steel Co. and Allegheny Ludlum Steel Corp. have cut prices on silicon sheet and strip.

Unemployment Edges Up

UNEMPLOYMENT currently is estimated at 3 million persons, up about 400,000 from January, by Ewan Clague, commissioner of the Bureau of Labor Statistics. Mr. Clague believes the figures are not alarming and that unemployment can rise to 4 million by early spring. If unemployment should go to 5 million and remain there for any considerable period, the BLS head said, it would become a matter of concern.

Meanwhile announcements of layoffs by manufacturing companies continue to spot the country's newspapers. At the same time, some workers furloughed during the winter are being called back, offsetting to an undetermined extent the downward employment trend.

Salesmen Alert for Business Calm

SALES captains are scanning the economic horizons and preparing to hang every spare shred of sail to carry their ships through any future business calms.

Worthington Pump & Mfg. Co. is

now guaranteeing credit aid to distributors of its air conditioning and refrigeration equipment in a sales-spurring plan which may be the forerunner of similar programs in other durable goods lines. A maker of vacuum cleaners is sponsoring a sale offering its product at a 30 per cent reduction; hitherto price shadings in home appliances have been almost exclusively at the retail level. Classified advertising in newspapers for salesmen wanted has increased, particularly for automobile sellers. Purchasing agents at last week's Products Show in Chicago generally agreed that soon they will be able to select, not grab, in a market where salesmen no longer will merely "accept" orders.

Buyers' Market Portents Seen

EVEN many of the salesmen at the Products Show welcomed the shift from a sellers' to a buyers' market.

They could point to these signs of change: Lower-priced cars in some areas can now be purchased off the floor. Westinghouse Electric Corp. reports that delivery dates on standard design turbine generators, power transformers, large motors, switchgear equipment, distribution transformers, control instruments and street lighting apparatus have improved 10 to 50 per cent since 1947. Small electric motors are in some cases going begging. One manufacturer is offering heavy 1/2 hp units to its employees at less than \$6. Another large electrical manufacturer has broadened its employee discount plan. A maker of drawing compounds and other industrial chemicals is experiencing a 30 per cent drop in business compared with last year.

Small Screw Machine Lag Predicted

SCREW Machine Products Association reports that its members estimate their business will drop 8.8 per cent from 1948, provided there is no price change.

Survey Shows Business Decline

CONTINUATION of the downward trend in business activity during January was reported in the monthly survey of the Purchasing Agents Association of Chicago with inventories, production, employment and backlogs all reflecting the downward cycle. In addition, 76 per cent of the reporting members stated that they are now on a 60 day or less purchasing policy and only 2 per cent reported a buying policy of longer than 90 days.

Deliveries from vendors continued to improve in January with 69 per cent of replies indicating speedier deliv-

eries, as compared with 66 per cent in December and 36 per cent six months ago.

Hardware Backlogs Melt

ORDER BACKLOGS of a large midwestern wholesale hardware house have melted away in the last two months, and with improvement in deliveries from manufacturers this wholesaler now has its order-filling on most items, excepting nails, on a current basis. This wholesaler is still on mill allocations of nails and finds it necessary to keep its customers on allocations also. Special offers of hardware items to retailers are meeting with little enthusiasm, and the wholesaler's representatives are finding they no longer are order-takers but must be salesmen instead.

Cost-Consciousness Grows

ONE COMPANY looking forward to good business is a midwestern maker of conveyors. It sees high labor rates forcing industries into adopting more labor-saving equipment. Some entire programs of industrial expansion have been abandoned, but further mechanization of existing plants continues at a strong pace, sustaining the demand for conveyors. The conveyor manufacturer foresees no severe recession, for, it points out, there is a heavy unsatisfied demand for many products—a demand that has not been expressed because of high prices.

Chrysler Prices Up

PRICES on 1949 Chrysler, Dodge, De Soto and Plymouth passenger cars were announced last week and average 6.66 per cent higher than previous models with comparable equipment. Two Plymouth lines are up \$65 and \$94, respectively, or 4.85 and 6.20 per cent. Two Dodge series are up \$122 and \$116, or 7.49 and 6.75 per cent; two De Soto series \$143 and \$139, or 8.27 and 7.18 per cent. Increases in four lines of Chryslers range from \$141 to \$252, averaging 7.27 per cent higher for sixes and 7.69 per cent for eights.

Total Manufacturing Income Up

NET income after taxes of all United States manufacturing corporations was estimated at \$2.9 billion for the third quarter of 1948, according to the quarterly report by the Securities & Exchange Commission and the Federal Trade Commission. This rate of profit was about \$60 million higher than for the preceding quarters and about \$480 million above the profits in the corresponding period of 1947.

Fourth Round Pay Rise Rejected by GE

Tells union that first three postwar increases brought no lasting benefit to workers. Frowns on proposals for more liberal social insurance and pensions plans, shorter work-week

ORGANIZED labor met its first major rebuff in its drive for fourth round wage increases, liberalized social insurance and pensions at the hands of General Electric Co. in a prenegotiation skirmish.

The company told the United Electrical, Radio & Machine Workers-CIO that it believes a fourth round wage increase would be "wrong for our employees and wrong for the country," and also made clear its opposition to the union demands for larger pension and welfare programs. It frowned on a union proposal for a shorter work-week with no reduction in pay.

GE, with 200,000 employees, often is regarded as the pattern-setter in the electrical manufacturing industry. A year ago the company helped spearhead an anti-inflation campaign by refusing a third round wage increase, but capitulated after General Motors had granted an increase.

Ask \$11.09 Weekly—The UE is demanding a wage increase to con-

pensate for an estimated loss of \$11.09 a week in purchasing power since January, 1945; a reduction in hours with no reduction in pay; improvement in existing pension, health and welfare programs.

Under the contract between GE and the union, the only issue that can be negotiated this year is wages. The agreement runs until 1950, with only one reopening permitted this year. This would automatically rule out any consideration of reduced work-week, pensions or insurance when negotiations formally are opened.

Three Rounds Didn't Help—L. E. Boulware, GE vice president in charge of employee relations, pointed out that the first three postwar wage increases had not brought any lasting benefits to workers.

May Ask Pensions from GM

UNITED Automobile Workers-CIO will ask General Motors to grant

any social insurance or pensions benefits it is able to wrest from Ford or Chrysler during this spring's negotiations.

Although the GM-UAW contract runs through May 29, 1950, and does not provide for any reopening, the union holds that GM will have to go along with any concessions on social security made by its two largest competitors.

Walter Reuther, UAW president, outlined the union's plans after a conference of union representatives on economic objectives. He pointed out that a clause in the present contract calls for a joint union-company committee to study pensions if the Supreme Court rules they are a proper subject for collective bargaining. A high court decision on this issue in the Inland Steel Co. case is expected in March.

If Ford or Chrysler sets up social insurance or pensions plans, says Mr. Reuther, GM cannot isolate itself.

Ford Negotiations in May—Bargaining between Ford and the union is scheduled to get underway the middle of May, two months before the contract expires. Chrysler talks are scheduled to start June 15, although the union is expected to stall until an agreement is reached with Ford.

As soon as a pattern is set, says Mr. Reuther, the union will press for pension and insurance discussions with GM.

Union Objectives—UAW will ask for pensions of \$100 a month for all workers with 25 years' service, such payments to be in addition to federal social security benefits; hospital and medical care program, with benefits for sickness, disability and death; and a cost-of-living adjustment in wages to bring purchasing power to the June, 1946, level. Total cost of the demands is estimated at 30 cents an hour. The union repeatedly has emphasized that it will stress the social security benefits, suggesting to some observers that the wage increase demand might be washed out in the early negotiations.

Rubber Workers To Ask Raise

UNITED Rubber Workers-CIO will ask a 25-cent hourly wage increase and company-financed pensions of \$100 a month in 1949 negotiations.

The union says it will emphasize the straight wage demand as the primary objective, and pensions as the secondary objective. Other fringe issues, including social insurance and guaranteed annual wage, will trail along.

The rubber workers union's em-



OPPONENTS: Secretary of Labor Maurice Tobin, left, and Sen. Robert Taft (Rep., O.) are the top level opponents in the drafting of the new labor-management relations act. Mr. Tobin wants the Wagner act provisions, while the Ohio senator is fighting for inclusion of many provisions of the Taft-Hartley act. NEA photo



NEW TUG: This new diesel-electric tugboat has gone into operation at Marine Ways of Carnegie-Illinois Steel Corp.'s Clairton Works to shift coal barges supplying coal to the coke plant. Built by St. Louis Shipbuilding & Steel Co., St. Louis, the vessel utilizes diesel-electric drive to eliminate difficulty experienced in reversing a direct drive diesel engine as often as required in this service

phasis on straight wages is at variance with other big CIO unions, which will accept social insurance and pensions over rate increases.

The union also will seek to bargain on a company-wide basis with the Big Four and on an industry basis with the smaller companies.

Oppose Pricing Bill

CIO wants Johnson measure "tabled"; Grange favors further study of provisions

OPPOSITION to the Johnson bill to clarify confusion surrounding pricing policies was expressed to the Senate Fair Trade Practices subcommittee by spokesmen for the United Steelworkers of America-CIO and the National Grange.

Otis Brubaker, union research director, urged the committee to "table" the Johnson-Capehart bill which it is now considering and to leave the Federal Trade Commission free to continue to try to find a middle ground between the basing point and the f.o.b. mill pricing systems. "This proposed legislation would neither establish such a middle ground nor would it leave the commission the needed authority to do so," the union representative testified.

No Formula by Law—Mr. Brubaker said the union believes that those forms of freight absorption which promote cross-hauling and uniformity of prices should be prohibited while freight absorption should be permitted to the extent to encourage competition and avoid unnecessary differentials between customers. The union does not believe, however, that

any such formula can be written into law; it must be worked out by an administrative agency.

J. T. Saunders, legislative counsel for the National Grange, said that we hope "that careful consideration will be given by the committee to postponing a favorable report on this bill until further study may be given it."

Would Tighten Trust Laws—Sen. Francis J. Myers (Dem., Pa.) also favors postponement in enactment of the legislation in order to provide Congress with opportunity to review the antimonopoly statutes with a view to "tightening them up." He has introduced a bill that would declare a moratorium on new prosecutions of business for absorbing freight on an individual basis. According to the senator, his bill would "suspend for two years any application of the Federal Trade Commission Act and the Clayton Act" in depriving individual companies of the right to independent use of delivered price systems, in the absence of conspiracies or restraint of trade.

At the same time, Sen. Edwin C. Johnson (Dem., Colo.), author of the bill to legalize freight absorption, introduced a new measure designed to remove any doubt about the legality of such action.

Analyze Basing Point Pricing

BASING point system and other aspects of pricing are discussed in six articles by staff members of the Federal Trade Commission in the January, 1949, issue of the *Georgetown Law Journal*.

The basing point system provides

the central theme of these articles, which deal with various aspects of the problem and contain an analysis of court decisions.

Authors of the articles are: Corwin D. Edwards, chief economist, FTC; William S. Johnson, principal economist, Bureau of Industrial Economics, FTC; Walter B. Wooden, associate general counsel, FTC; Joseph E. Sheehy, associate director, Bureau of Legal Investigation, FTC; Joseph S. Wright, attorney, FTC; Robert B. Dawkins, attorney, FTC.

Reuther Housing Plan

Union chieftain proposes surplus aircraft plants produce low-cost homes

THE 1949 model "Reuther plan," already submitted to President Truman by Walter P. Reuther, president of the United Automobile Workers-CIO, briefly envisages transfer of all surplus aircraft-producing facilities of the country to the National Housing Authority for co-ordination into the mass production of low-cost homes. Reuther's original wartime plan for building 500 airplanes a day may be recalled, principally for its socialized concepts.

The newest plan is heroically titled, "Homes for People, Planes for Peace, Jobs for Prosperity." Its author charges the federal budget for 1950, which channels 75 per cent of government expenditures into payment for war or the threat of war and less than 1 per cent into housing and community development, is spelling "potential disaster." He goes on to claim that 90 per cent of the plant reserve of the airframe and aircraft engine industry is public property since it was largely government financed; that the aircraft industry "is a public utility in function and strategic importance"; therefore, the disposition of the industry is a public matter.

On the need for housing, Reuther claims 7.5 million slum dwellings should be torn down, while 4.5 million other houses need major repairs, outside of consideration for the 15 million nonfarm homes more than 35 years old. He sees a national need of 20 million new homes in the next ten years. To fill these needs, the National Housing Authority would "mobilize research and engineering skills in housing" and move toward conversion of idle aircraft plant to production of prefabricated housing units. Such "federal intervention in the form of a massive housing program" would be an offset to further employment slumps which Reuther envisages, as well as making use of the skills of 4000 tool and die workers.

in the automotive industry who, he says, are now unemployed.

Financing, he suggests, could be accomplished through reduction of appropriations for finished aircraft headed for speedy obsolescence, and application of the funds instead to staffing and equipping of prefabricated housing plants which would be kept ready for instant conversion to mass airplane production.

War on Air Pollution

Industry ponders long-term implications of growing urban emphasis on smoke, fume control

INDUSTRY is pondering the long-term implications of the growing urban emphasis on air pollution control. Will such control force industry to make huge expenditures for smoke and fume abatement equipment? What are the prospects for the companies making this apparatus?

Precise answers to these questions are not yet possible, but it is clear that the problem is being attacked with increasing vigor. Twenty-six of 29 industrial communities surveyed by STEEL are tightening their defenses.

Appropriations Up Ten-fold—In the case of Cleveland, the 1949 appropriation of \$103,000 is more than ten times the 1939 allotment. Chicago's 1949 appropriation of \$197,467 compares with \$182,489 in 1948. Pittsburgh will increase its spending by \$10,000. Last year Cleveland received 650 complaints about industrial nuisances other than smoke involving 201 plants. The city's ten inspectors made more than 20,000 investigations of reported smoke ordinance violations during the year.

Eight cities queried have higher appropriations for 1949 than for 1948; these eight, plus six others, will expand activities during the coming year. None will curtail its efforts, and only three, in the Southwest, have no need for pollution control. Four cities, among them San Francisco, are now drafting new ordinances. Municipalities the size of Tiffin, O., (1940 population: 16,102) are considering programs. Several federal government agencies have lent their support, and the 41-year-old Smoke Prevention Association of America is broadening its scope.

Industry Responsible for 60 Per Cent—Although it is difficult to estimate precisely the sources of air pollution, consensus is that 60 per cent is caused by industry and railroads, 15 per cent by commercial building and 25 per cent by homes

and apartment buildings. In several instances, companies now face damage suits alleging injuries from fumes.

H. G. Dyktor, commissioner of Cleveland's pollution control program, comments: "We have no desire to throw any industry out of business." He has the power—very rarely used—to close a violator's plant. Along with ten officials from other cities, he observes that high costs of control equipment must be considered. In many areas now a practical attitude has been adopted which takes into account the particular firm's financial status, degree of disruption to manufacturing which control modifications would entail, delivery time necessary for some control equipment and other factors. Several cities have put pollution control on a more scientific basis, with the object of setting up a service to aid industry, not police it.

Industry in some areas has taken the initiative. Chicago Association of Commerce & Industry's cleaner air committee functions through several industrial subcommittees and 21 organizations, including labor unions, concerned with heating equipment. The unit assisted in reducing the dust fall from 61.3 tons deposited over each square mile of Chicago each month in 1947 to 55.9 tons in 1948. Association's newest industrial group is a foundrymen's subcommittee which will concentrate on helping solve pollution problems of smaller foundries with no research or engineering sections. The railroad subcommittee last year was instrumental in reducing reported railroad smoke ordinance violations by 35 per cent.

Co-operation Excellent—Industry's co-operation has been excellent, most officials comment. One example was cited in particular where a firm spent \$200,000 on pollution control

equipment. This sum is unusually high, however, and many problems can be solved at the expense of only a few hundred dollars. Four communities report they are co-operating with private producers of control equipment to lower costs.

The dilemma of costs has been found not so serious as first imagined by some companies. Although Pontiac Motor Division of General Motors Corp. spent \$300,000 to install six cupolas equipped with dust suppressors, production capacity of these units then increased 50 per cent. The Saginaw, Mich., plant of GM's Central Foundry Division, the Chevrolet Gray Iron Foundry in Saginaw, the Buick foundry at Flint, Mich., Delco-Remy's foundry at Anderson, Ind., and the McKinnon Industries foundry at St. Catharines, Ont., are similarly equipped. Other GM foundries are preparing for installations.

Metal Show Covers All Industry

SPEAKERS from all phases of the metalproducing and metalworking industries will deliver more than 100 papers at the Western Metal Congress and Exposition in Los Angeles, Apr. 11-15.

Exposition and most of the technical sessions will be held in Shrine Convention Hall. With approximately 200 companies participating, the exposition will include displays of new alloys, welding and heat treating equipment, foundry supplies, inspection and testing devices, machining equipment, and metal-cutting tools.

Although 20 national technical societies are co-operating, five will offer programs: American Society for Metals, American Welding Society, American Foundrymen's Society, American Institute of Mining and Metallurgical Engineers, and Society for Non-Destructive Testing.

Calendar of Meetings

Feb. 28-Mar. 4, American Society for Testing Materials: Spring meeting and committee week, Edgewater Beach Hotel, Chicago. Society headquarters are at 1916 Race St., Philadelphia.

Mar. 3-5, American Society of Training Directors: Fifth annual conference, Hotel Carter, Cleveland. Society headquarters are at 705 Fidelity Bldg., Cleveland.

Mar. 6-9, American Institute of Chemical Engineers: Regional meeting, Biltmore Hotel, Los Angeles. Southern California Section headquarters are at 800 Roosevelt Bldg., Los Angeles.

Mar. 8-10, Society of Automotive Engineers: National passenger car, body and production meeting, Hotel Book-Cadillac, Detroit. Society headquarters are at 29 W. 39th St., New York.

Mar. 10-12, American Society of Tool Engineers: Seventeenth annual meeting, Hotel William Penn, Pittsburgh. Society headquarters are at 1666 Penobscot Bldg., Detroit.

Mar. 11-12, Ohio Regional Foundry Conference: Second conference, to be held on Ohio State University campus.

Mar. 14-17, Chicago Technical Societies Council: Seventh Chicago production show. Show manager is Edward C. Bowman, 8 S. Michigan Ave., Chicago.

Mar. 17-18, American Management Association: Meeting to discuss competitive marketing methods in buyers' market, Hotel Statler, New York. Association headquarters are at 330 W. 42nd St., New York.

Mar. 22-23, Export Managers Club of New York Inc.: Meeting, Hotel Statler, New York. Club headquarters are at 2 Lafayette St., New York.

Mar. 24-26, Electrical Maintenance Engineers Association of Southern California: Third annual industrial electrical show, Shrine Convention Hall, Los Angeles.

Mar. 28-Apr. 1, American Chemical Society: 115th national meeting, on sour crude oil, San Francisco.

Europe Watches U.S. Prices

Sees signs of disinflation in its own economy as prices fall even in France

WESTERN Europe, which sometimes feels it is the tail on the United States economic kite, is anxiously hoping that the kite is not preparing for a dive.

In addition to close economic connections with America which would influence a European recession, Europe also sees disinflation stemming from domestic sources. Prices are falling even in France, and industrial production has soared. In the output of coal, for example, Great Britain mined 234 million net tons in 1948 compared with 221 million in 1947. Western Germany dug 183 million net tons compared with 156 million in 1947. French production fell from 52 million net tons in 1947 to 46 million last year, but output in months unaffected by the strike ranged as high as 16 per cent above the 1937 average. In the closing quarter of last year, British production averaged about 90 per cent of 1937 tonnage. Western German output during the last quarter averaged 85 per cent of 1937. French output during the final three months was 105 per cent of 1937 production.

France

ALTHOUGH French prices have fallen only in food and agricultural products, this is taken as a sign that the nation's economy is entering a new stage. Industrial prices have not dropped but consumer and some capital goods are now more plentiful. The general retail price index which was 1883 (1938=100) on Feb. 10 has dropped to 1836. The general wholesale price index has increased only 28 per cent since ERP began, compared with a 55 per cent jump before ERP.

Another factor contributing to a leveling off has been the slightly improved export-import balance. In 1948 French exports amounted to 48.7 per cent of imports. In 1947 the exports were only 47.5 per cent of imports. France has always imported more than she exported—in 1938 her exports were 65.7 per cent of imports—but before the war her tourist trade and overseas investments paid for the balance. Today these sources are not sufficient.

Jap Ore, Pig Iron For Sale

IRON ore, manganese, raw or dead-burned magnesite and pig iron are

available for purchase from Japan by American firms.

Japanese Board of Trade is soliciting f.o.b. and c.i.f. offers for these materials. American purchasers will be required to establish a 20 per cent performance bond before contracts can be concluded. Information on closing dates for offers or on quantities of these materials available may be obtained by direct communication with the Japanese Board of Trade, Tokyo, Japan, or with the Foreign Trade Division, Economic & Scientific Section, SCAP, APO 500, c/o Postmaster, San Francisco.

Steel Exports Drop 34%

Shipments total for latest year lowest since 1939. Decline more than 2 million tons from 1947

EXPORTS of iron and steel in 1948 declined 34 per cent, or more than 2 million net tons from the 1947 total, according to the Department of Commerce. Yearend total released by the department shows that 4,354,061 net tons of semifinished and finished products were exported during the year as compared with 6,591,282 tons in 1947.

Declines were registered in all major classifications except welded and seamless casing and oil line pipe which increased to 371,918 tons from 333,498 tons the preceding year. Leading export item, tonnage-wise, was tin plate and tagger's tin which aggregated 604,972 tons, about 4500 tons below 1947 exports. Other leading tonnage items on the 1948 export list included: Ingots, blooms, slabs, etc., 219,197 tons; steel bars, excluding alloy, 309,476 tons; plates, not fabricated, 319,043 tons; black steel sheets, 416,121 tons; structural shapes, 453,278 tons; and rails, 308,374 tons.

Exports in 1948 by product groups:

	(Net Tons)
Semifinished	315,314
Iron and steel bars	558,786
Sheet and plates	1,610,760
Structural shapes	490,970
Railroad supplies	418,852
Tubes, pipe and fittings	603,361
Wire products	259,124
Nails and other fasteners	96,894
Total 1948	4,354,061
Exports in recent years:	
1947.....	6,591,282
1946.....	4,747,397
1945.....	4,839,568
1944.....	5,819,250
1939.....	2,493,822
1943.....	6,954,733
1942.....	7,017,713
1941.....	6,403,474
1940.....	7,918,344

Allocation Programs Approved

APPROVAL for public hearing of five voluntary allocation programs was announced last week by the Department of Commerce.

New programs include: Reclama-

tion projects, which will receive 83,600 tons of steel; and Economic Cooperation Administration, which will receive 161,870 tons over the next five months.

Department will license 25,000 tons of 30-inch steel pipe for export for the Trans-Arabian Pipeline during the first quarter. This pipeline already has been produced and is in storage in California. Total authorized for export for the line now is 79,000 tons, against total requirements of 260,000 tons.

Up for renewal are the warm air heating program, which is scheduled to receive 26,400 tons monthly from April through June; and baseboard radiation, slated to receive 950 tons monthly, April through June.

The 16 allocation programs now in effect will require about 560,000 tons of steel monthly, 10 per cent of total production. Actually, the allocation program is diverting only 2 to 3 per cent of steel output into the favored programs above what these programs would normally get.

Gives Shows for Stockholders

TO DEMONSTRATE to stockholders the importance and profitability to them of a company policy of retaining and spending sufficient funds for research rather than draining them off through large dividends, Curtiss-Wright Corp., New York, is holding one-day exhibits in more than a dozen cities.

The exhibits, most of them animated, show the company's products and give a peek into the future of supersonic aircraft and satellite missiles, and point out that Curtiss-Wright is participating in the research, development and testing of every form of future flight. This, the company emphasizes, necessitates its maintenance of financial strength to sustain research and requires that it be equipped to move into the new forms of flight with all the needed men, money and machines.

The exhibit, open to the public, is a reminder that even in peacetime the nation must have a virile program of plane and flight development as a measure of self-protection and an insurance for peace, William C. Jordan, company president, said.

Being taken to cities where large numbers of Curtiss-Wright stockholders live, the exhibit has already visited Paterson, N. J., Rochester, N. Y., Washington, D. C., Baltimore, Philadelphia and Cleveland. Next stop will be Los Angeles.

Various other companies, impressed with this public relations show, have asked for details and cost figures.

ERP Tool Sales Weak

Action by Congress needed to give U. S. builders a fair share of market, says NMTBA official

CONGRESS should authorize the Economic Cooperation Administration to direct participating nations to include American machine tools in their requests for allotments, where such have been specified and requested by industrial users. This was the recommendation of A. G. Bryant, representing the National Machine Tool Builders' Association, Cleveland, in his testimony before the Senate Foreign Relations Committee.

Operations in the American machine tool industry have been at less than one-half of its capacity, the gross volume in 1948 being \$288 million which in units was less than 1937 shipments, Mr. Bryant stated. Of the approximately 200 manufacturers building machine tools at the war's end, 29 concerns have since then been consolidated or have discontinued business. Many other plants, in re-

cent months, have found it necessary to operate on as low as a 32 hour basis with reduced working staffs.

Strong Industry Needed—Although it is generally agreed, Mr. Bryant continued, a strong machine tool industry is vital to recovery abroad, to sound economics at home and to national security, loss of the export market has weakened the industry. Industry indicates, spokesmen say, at least one year would be required for machine tool building volume to attain the rate which the National Security Resources Board considers essential for security.

Surveys made last summer indicated that actual orders amounting to at least \$150 million had been placed by European industrialists and were awaiting action by local governments in obtaining licenses for import and authorizations for ECA dollars. In a majority of cases these requests were blocked.

Asks ECA Policy Change—According to Mr. Bryant, a change in direction of ECA policy and performance with respect to machine tools is vital for the following reasons:

1. Recovery in Europe has been slowed down because American machine tools available for almost immediate delivery have not been utilized, while ECA funds have been used to finance purchase of British and European machines of less productivity and unavailable in many cases for one or two years.

2. Building up machine tool manufacture in these countries has enabled them to ship vital machines to Russia and its satellites.

3. Unnecessary purchase of European machine tools in place of American machines requested by European industrialists has diverted vital labor and materials when these could have been used to better advantage in manufacture of other products.

4. By unnecessarily usurping a large part of the normal market of the American machine tool industry, the ECA participating nations have weakened an industry of paramount importance.

Machine Tool Orders Climb

PRELIMINARY estimates by National Machine Tool Builders' Association, Cleveland, show that its index of new orders continued to climb for the third consecutive month and reached 87.1, highest point since June, 1947. Foreign orders likewise advanced to the highest point since November, 1946, reaching 21.9. Index figures for new orders and foreign orders in December were 76.7 and 16.2, respectively. January shipments were down to 68.8 from 96.9 in December.

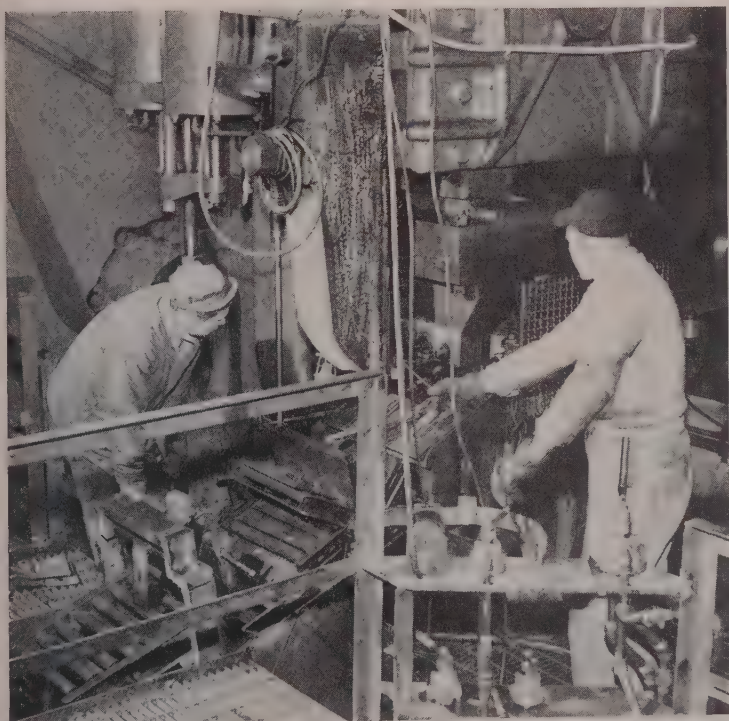
New orders and shipments indexes are based on average shipments in 1945-46-47. Foreign orders are included in new orders and based on the same figures.

Continental Foundry Rate Up

CONTINENTAL Foundry & Machine Co., East Chicago, Ind., manufacturer of rolling mills and steel plant equipment, operated at about 85 per cent of capacity for 1948 fiscal year, compared with 75 per cent for 1947.

At the end of the 1948 fiscal year, Nov. 30, the company's order backlog equaled those at the end of fiscal 1947, although orders for the last four months of fiscal 1948 dropped.

Company spent about \$1.7 million last year on additions and improvements. This amount includes the net plant assets acquired, through purchase May 31, of Vulcan Soot Blower Corp., DuBois, Pa., and Northern Equipment Co., Erie, Pa., now wholly owned subsidiaries making cleaning equipment and regulating devices, respectively.



TIE PLATES IN WEST: Tie plates for western railroads now are being produced for the first time in southern California with installation of new equipment in the Torrance plant of Columbia Steel Co. Special equipment, as shown in this photo, for finishing tie plates includes a 12-foot high punch and shear machine weighing 65 tons. Equipped with conveyor bed and occupying a space 15 x 65 feet in the rolling mill, the machine is designed to exert 1200-ton pressure

President Truman's proposal to use government funds for expanding "key" industries disturbing in its implications of increasing trend toward nationalization

DISTURBING thing about President Truman's proposal to use government funds, by investment in the government's behalf, to expand "key" industries is the implication that this method of getting the government into the field of business competition now is offered as a broad national policy.

Up to this time the government's entry into the field of business through the avenue of investment of public funds has been regarded as something of an exceptional character—and certainly not aimed at the basic free enterprise system.

Increasing Nationalization—If the President gets authority from Congress to invest government money in steel plants, as he specifically proposes, there is no valid reason why he could not put the government into the lumber, meat, coal mining or any other industry. Business observers in Washington generally feel that if the President's request is granted in connection with steel, we will be fairly launched on the road toward eventual nationalization of a variety of industries.

There is nothing specially new about the President's request to loan government funds to encourage expansion in certain key industries, ex-

cepting for the implication that the government will identify those industries which, in the opinion of its experts, need expansion.

Today government funds may be borrowed from a number of agencies. The total business they do is not easy to estimate, but from the indications it is running to many hundreds of millions a year.

Through the courtesy of officials of the Reconstruction Finance Corp., STEEL is in a position to report some of the latest business loan data of this agency—the government's most important in making business loans.

Loans Granted—In December, 1948, RFC granted 1473 loans for a total of \$145 million.

All were made after the RFC had received reasonable assurance of repayment. The great majority were small loans—smaller than \$100,000—and most of them were made to finance equipment purchases or provide necessary working capital. One of the important angles considered by the RFC was the effect of the loans in stabilizing the economy and in promoting employment or maintenance of employment. Of the total \$145 million, the portion loaned in participation with banks was \$13.6

million, while the remaining \$131.4 million was loaned wholly by RFC.

Only seven of the above loans were for amounts of \$500,000 or more. They are as follows:

Glenn L. Martin Co., Baltimore, \$2,800,000, for working capital, 1-year maturity.

Michigan Chemical Corp., St. Louis, Mich., \$3,500,000, for building construction, 7-year maturity.

Newark Industries Inc., Newark, O., \$500,000, for working capital (2/3) and new equipment (1/3), 5-year maturity.

Paper Container Mfg. Co., Chicago, \$765,000, 40 per cent for machinery and equipment and 60 per cent for refunding debt, 7-year maturity.

Vinnel Co. Inc., Alhambra, Calif., a "heavy engineering steel fabricator," \$650,000, for new construction, working capital and debt payment, 5-year maturity.

Reo Motors Inc., Lansing, Mich., \$5,700,000, 65 per cent for new machinery and 35 per cent for debt payment, 5-year maturity.

Denver Tramway Corp., Denver, \$6 million, 60 per cent for equipment and 40 per cent for construction, 10-year maturity.

European Investment Encouraged

AS PART of ECA's investment guaranty program designed to encourage



PRESIDENT TRUMAN AND CABINET: Administration leaders shown above in the latest picture of the President and his cabinet are, clockwise: J. A. Krug, Interior; Charles Sawyer, Commerce; Vice President Alben Barkley; Mau-

rice Tobin, Labor; Charles Brannan, Agriculture; Jesse Donaldson, Postmaster General; James Forrestal, Defense; Dean Acheson, State; President Truman; John Snyder, Treasury; and Tom Clark, Attorney General. NEA photo

McKAY

RESISTANCE WELD TUBE MILLS

PRECISION BUILT FOR CONTINUOUS PRODUCTION



Machine illustrated above is a complete Tube Mill, capable of producing 2" O. D. to 4½" O. D. tubes from 16 ga. to 8 ga. flat strip. McKay builds Tube Mills in sizes ranging from ¾" O. D. We solicit your inquiries.

McKay Electric Resistance Weld Tube Mills can be put to work quickly and easily in your plant. Your present dependable personnel, after instruction, will become entirely competent to operate a McKay mill.

This has been accomplished by:

- 1 Simplifying and centralizing all necessary controls.
- 2 Complete protection through approved safety devices and interlocks.
- 3 Supplying motor drives and push button controls to essential heavy duty motions.
- 4 Eliminating necessity of welding from coil to coil strip from coil threads itself through machine, without manual assistance.
- 5 Automatic Rotary Head Cut-off (patent pending) producing lathe cut and accurately maintaining desired lengths.
- 6 Providing simple, easy means of changing rolls for other tube sizes.
- 7 Typical rugged McKay construction insures high production with a minimum of maintenance.

The **McKAY MACHINE Company**

ENGINEERS AND MANUFACTURERS OF SHEET, TUBES, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY

The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

American industry to invest its dollars in projects that will promote European recovery, a \$300,000 guaranty contract has been signed with Minneapolis-Honeywell Regulator Co., Minneapolis.

Minneapolis-Honeywell will invest \$300,000 in its wholly-owned subsidiary, Honeywell-Brown Ltd., which since 1936 has sold Minneapolis-Honeywell products in the British market. The latter company has leased a plant near Glasgow, Scotland, in which it will fabricate most of the parts needed in Minneapolis-Honeywell indicating, recording and controlling instruments.

Making ECA Dollar Go Further

IN ANOTHER move designed to make the ECA dollar go further in promoting European recovery, the Economic Cooperation Administration has adopted a new policy covering payment of commissions to foreign agents of suppliers of ECA-financed commodities and services.

Under this new policy, suppliers, as in the past, will follow regular trade practice of paying commissions to their foreign agents. In cases where such commissions are included in the purchase price of commodities and services paid for by ECA, the dollar amount of the commissions will accrue to the treasury of the participating country. The foreign agent will receive an equal amount in the local currency of the country.

ECA proposes to bill each of the participating countries monthly for the dollar amount of these commissions. ECA in turn will reprogram these dollars for additional purchases rather than permit these dollars to be used outside the ERP program.

Quick Payment Plan Adopted

NEW SYSTEM, especially adaptable to small transactions, by which ERP countries may make quick payment to American suppliers for items purchased under ECA financing, has been inaugurated by the Economic Cooperation Administration.

Marking the first transaction by which a foreign government issues a draft directly on a U. S. government agency, French officials presented a draft as payment to a U. S. supplier for \$983.40 worth of spare parts for clamshell buckets on six-ton cranes operating at Rouen and at Dunkirk, France.

Designed as a simplified alternate method to the letter-of-credit type of dealing, the system foregoes payment of interest, fees or exchange. It eliminates correspondence and book-keeping.

Where Does Finished Steel Go?

Picture of distribution of leading products by geographical areas obtained from Martin committee investigation. May be used by metalworking companies in studying markets

IMPORTANT by-product of the Martin committee's investigation of steel distribution has been the gathering of a large amount of information on the use of steel by geographic areas.

Returns from comprehensive questionnaires submitted last fall to 14

large steel producers have provided data on where 11 major steel products go. These include hot and cold-rolled sheet and strip, hot and cold-finished bars, butt-weld, lap-weld and seamless pipe and electric-weld and

(Please turn to Page 58)

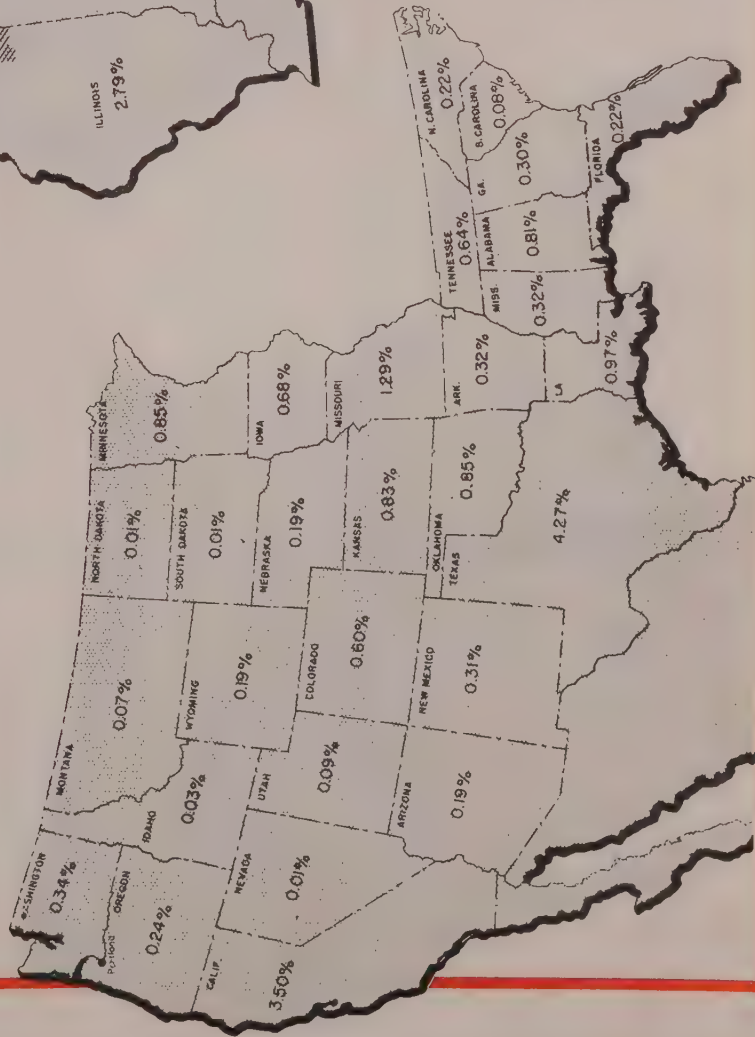
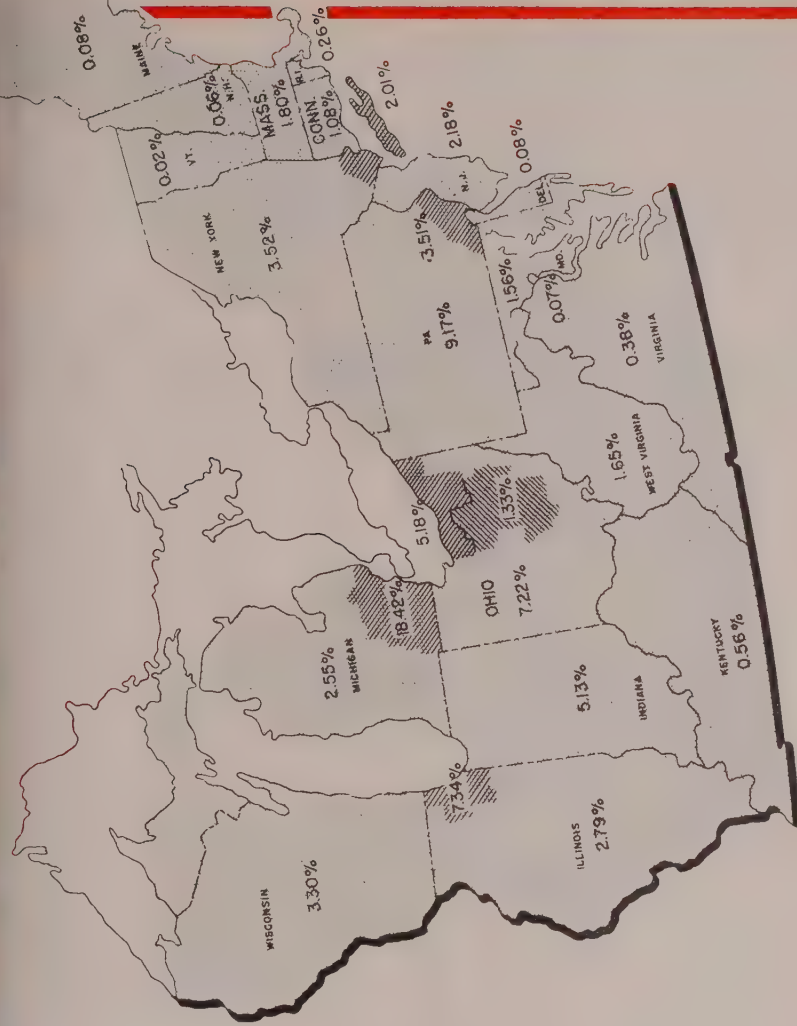
COMBINED SHIPMENTS OF 11 STEEL PRODUCTS BY AREAS

Area	1940		1947	
	Net Product Tons	Per Cent	Net Product Tons	Per Cent
Alabama	117,604	0.8315	175,117	0.8189
Arizona	12,414	0.0878	41,331	0.1933
Arkansas	18,336	0.1296	69,730	0.3261
California	482,181	3.4090	749,408	3.5044
Colorado	30,448	0.2153	128,749	0.6021
Connecticut	123,415	0.8725	232,356	1.0865
Delaware	7,498	0.0530	17,904	0.0837
District of Columbia	12,299	0.0870	16,959	0.0793
Florida	34,215	0.2419	47,747	0.2233
Georgia	56,549	0.3998	64,809	0.3031
Idaho	6,804	0.0481	8,051	0.0376
Illinois:				
Chicago area	953,267	6.7396	1,571,698	7.3496
All other Illinois	461,764	3.2647	597,586	2.7944
Indiana	653,962	4.6235	1,097,386	5.1316
Iowa	76,739	0.5425	146,679	0.6859
Kansas	89,991	0.6362	178,352	0.8340
Kentucky	62,835	0.4442	120,674	0.5643
Louisiana	166,447	1.1768	208,516	0.9751
Maine	20,207	0.1429	18,587	0.0869
Maryland	175,577	1.2413	335,613	1.5694
Massachusetts	245,850	1.7382	386,649	1.8080
Michigan:				
Detroit area	3,237,436	22.8887	3,940,212	18.4252
All other Michigan	420,779	2.9749	547,068	2.5582
Minnesota	103,635	0.7327	182,133	0.8517
Mississippi	23,365	0.1652	70,320	0.3288
Missouri	183,548	1.2977	277,936	1.2997
Montana	13,762	0.0973	16,563	0.0775
Nebraska	23,801	0.1683	42,532	0.1989
Nevada	3,040	0.0215	1,901	0.0089
New Hampshire	14,098	0.0997	14,022	0.0656
New Jersey	319,707	2.2603	466,759	2.1827
New Mexico	24,023	0.1698	67,365	0.3150
New York:				
New York City area	291,008	2.0574	430,598	2.0136
All other New York	480,097	3.3943	753,731	3.5246
North Carolina	29,267	0.2069	49,083	0.2295
North Dakota	2,052	0.0145	3,259	0.0152
Ohio:				
Cleveland area	832,960	5.8890	1,109,832	5.1898
Canton-Massillon-Mansfield area	142,518	1.0076	285,284	1.3340
All other Ohio	945,675	6.6859	1,544,802	7.2238
Oklahoma	66,735	0.4718	182,048	0.8513
Oregon	33,327	0.2356	53,392	0.2497
Pennsylvania:				
Philadelphia area	533,241	3.7700	752,734	3.5199
All other Pennsylvania	1,075,723	7.6054	1,961,412	9.1719
Rhode Island	50,378	0.3562	55,909	0.2614
South Carolina	14,394	0.1018	19,230	0.0899
South Dakota	3,224	0.0228	3,383	0.0158
Tennessee	95,965	0.6785	137,404	0.6425
Texas	525,918	3.7182	913,972	4.2739
Utah	14,523	0.1027	21,290	0.0996
Vermont	6,740	0.0477	6,286	0.0294
Virginia	70,046	0.4952	83,206	0.3891
Washington	60,086	0.4248	73,739	0.3448
West Virginia	137,153	0.9697	354,906	1.6596
Wisconsin	548,037	3.8746	707,492	3.3084
Wyoming	9,595	0.0678	41,228	0.1928
All States	14,144,258	100.0000	21,384,932	100.0000

STEEL DISTRIBUTION

by

GEOGRAPHIC AREAS



COMBINED shipments of 11 major steel products by 14 leading producers to the various states and principal consuming districts are shown percentage-wise in this map. Products include hot and cold-rolled sheet and strip, hot and cold-finished bars, butt-weld, lap-weld and seamless pipe, electric-weld, mechanical and pressure tubing.

Countries included in specifically segregated areas of certain states are as follows: Illinois—Chicago area: Cook, Du Page, Kane, Lake, and Will.

Michigan—Detroit area: St. Clair, Macomb, Oakland, Livingston, Lapeer, Ingham, Jackson, Washtenaw, Wayne, Genesee, Hillsdale, Lenawee, Monroe, and Shiawassee.

New York—New York City area: Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, and Westchester.

Ohio—Cleveland area: Ashtabula, Cuyahoga, Erie, Geauga, Huron, Lake, Lorain, Portage, and Summit.

Ohio—Canton-Massillon area: Ashland, Carroll, Coshocaton, Guernsey, Harrison, Holmes, Medina, Morgan, Muskingum, Noble, Perry, Richland, Stark, Tuscarawas, and Wayne.

Pennsylvania—Philadelphia area: Bucks, Chester, Delaware, Montgomery, and Philadelphia.

STEEL DISTRIBUTION

(Continued from Page 56)
mechanical and pressure tubing. Not included are such important steel products as plates, shapes, wire and numerous others.

Data Long Sought—The information resulting from the committee's questionnaires, however, provide the most comprehensive picture of fin-

ished steel distribution by states and areas yet available. Metalworking companies are expressing great interest in the data which provide them with a means of checking their own markets; makers of metalworking equipment are especially interested in the figures and plan to use them in a variety of ways.

Combined shipments of the 11 carbon steel products by the 14 companies, which produce the bulk of the country's steel products (almost 80 per cent of hot-rolled sheets, for example), by geographic areas for 1946 and 1947 are shown on page 56.

Map on page 57 shows the percentage distribution in 1947 of the 11

Geographic Area*	SHEETS				STRIP				BARS			
	HOT-ROLLED		COLD-ROLLED		HOT-ROLLED		COLD-ROLLED		HOT-ROLLED		COLD-FINISHED	
	1940	1947	1940	1947	1940	1947	1940	1947	1940	1947	1940	1947
Alabama	24,651	46,778	69	1,993	1,920	8,860	239	585	65,053	84,050	599	1,121
Arizona	1,480	1,406	24	248	92	1,361	.....	73	3,662	5,101	12	11
Arkansas	1,248	2,399	106	519	117	2,683	6	1,157	3,824	1,294	145	8
California	130,274	194,542	17,572	37,180	9,535	16,580	4,941	10,988	96,730	118,998	7,682	23,292
Colorado	4,568	9,039	406	937	657	1,174	30	436	13,546	32,117	161	1,177
Connecticut	37,161	57,691	5,939	27,780	11,049	30,179	11,895	21,100	30,546	50,309	12,424	23,838
Delaware	736	7,806	27	2,108	8	201	2	45	639	1,440	6	.....
District of Columbia	1,038	1,945	48	794	222	181	9	5	1,953	3,787	34	.....
Florida	2,982	6,908	108	264	352	857	16	.....	12,422	13,265	259	.....
Georgia	9,086	8,667	855	2,487	1,227	2,872	98	1,143	9,318	17,272	1,150	1,400
Idaho	1,330	858	2	49	179	100	1	.....	2,008	2,907	1	.....
Illinois:												
Chicago area*	281,274	470,388	125,953	231,015	64,748	76,332	16,446	32,877	360,347	547,424	17,161	68,117
All other Illinois	103,092	130,076	24,198	56,952	31,689	27,655	8,123	25,294	147,709	207,163	3,281	14,600
Indiana	181,796	236,945	72,169	227,379	51,939	56,080	12,751	48,407	230,295	396,049	19,637	35,838
Iowa	27,614	43,700	8,567	19,804	3,878	6,230	209	1,193	18,284	35,864	3,897	7,000
Kansas	5,294	10,586	1,494	12,935	941	1,661	149	670	10,718	14,820	165	2,100
Kentucky	9,063	22,874	2,293	10,850	9,443	9,671	391	2,406	12,791	27,691	942	2,000
Louisiana	44,176	22,604	670	6,720	885	1,890	26	7	9,227	17,430	1,352	2,800
Maine	1,461	859	745	540	217	417	439	1,076	8,951	9,217	1,501	2,700
Maryland	105,466	223,899	3,571	23,917	3,491	7,367	583	1,543	29,271	45,012	2,918	3,000
Massachusetts	59,991	80,671	25,502	56,270	27,378	34,229	9,915	22,830	74,426	118,175	15,341	28,000
Michigan:												
Detroit area*	1,170,172	1,174,858	975,396	1,458,386	397,079	297,609	48,101	135,784	533,628	665,196	60,530	124,100
All other Michigan	153,397	86,528	153,009	282,275	12,917	15,323	8,642	20,009	34,128	48,554	13,429	26,000
Minnesota	25,792	41,406	16,734	33,973	3,705	5,807	369	2,046	36,895	61,821	1,419	7,000
Mississippi	1,409	3,461	42	801	96	3,321	.....	42	3,569	4,327	41	700
Missouri	78,329	80,158	17,970	43,128	6,808	6,564	1,759	8,410	24,469	46,581	3,113	19,000
Montana	990	1,922	74	.....	88	21	.....	.....	2,320	2,886	79	1,000
Nebraska	3,823	9,143	1,141	1,644	967	796	37	689	6,638	9,113	129	1,700
Nevada	327	87	.....	18	19	.....	.....	.....	760	276	4	.....
New Hampshire	8,396	9,580	324	363	153	29	113	369	1,748	1,096	439	2,000
New Jersey	99,414	93,102	31,334	62,073	24,483	28,504	10,379	21,874	80,583	133,891	12,497	22,000
New Mexico	471	725	.....	.....	68	113	.....	.....	6,051	4,793	12	600
New York:												
New York City area*	91,244	93,916	28,257	87,548	33,033	34,181	15,498	12,144	51,147	105,770	4,497	9,200
All other New York	131,956	123,299	44,396	145,849	25,344	30,837	26,532	55,981	167,903	274,432	16,616	26,000
North Carolina	4,852	6,049	1,282	3,710	866	2,040	31	90	5,494	11,688	526	2,000
North Dakota	623	779	11	.....	32	127	1	.....	238	697	.....	.....
Ohio:												
Cleveland area*	283,305	298,100	182,863	271,334	112,466	68,931	37,490	50,737	155,364	292,188	25,000	54,000
Canton-Massillon*	52,553	65,285	20,376	69,924	31,611	55,041	3,442	10,160	20,283	44,369	2,216	4,000
All other Ohio	394,262	456,315	136,433	402,388	83,431	111,084	18,043	74,718	190,125	272,641	31,355	68,000
Oklahoma	6,907	14,564	245	1,090	696	1,084	12	41	14,692	13,828	552	2,000
Oregon	9,179	9,892	612	1,533	787	1,539	69	465	7,275	14,678	934	2,100
Pennsylvania:												
Philadelphia area*	227,358	186,288	133,287	276,446	11,103	16,633	4,866	16,065	80,887	128,377	9,265	17,000
All other Penna.	232,357	372,810	47,157	218,356	109,189	168,581	9,598	18,334	475,709	774,832	13,206	23,000
Rhode Island	2,212	2,106	1,307	1,707	17,201	18,206	1,877	2,305	14,926	19,970	2,912	3,000
South Carolina	1,280	2,040	169	614	265	567	271	186	2,595	2,143	830	2,000
South Dakota	206	257	60	.....	8	59	1	27	437	903	1	.....
Tennessee	27,113	38,305	2,968	10,508	5,390	5,500	203	1,243	19,936	39,643	1,789	4,000
Texas	73,733	65,392	3,493	20,684	1,738	16,487	375	617	66,502	58,837	883	6,000
Utah	1,611	2,681	71	.....	182	272	1	22	6,116	9,544	209	1,000
Vermont	1,282	1,206	326	1,326	144	285	43	138	1,164	1,189	242	.....
Virginia	12,342	15,107	2,191	8,896	1,431	1,892	333	1,573	25,729	19,024	499	2,000
Washington	12,957	18,017	965	3,021	2,339	1,967	72	338	25,534	23,242	741	1,000
West Virginia	39,352	157,506	5,051	26,542	3,832	17,610	6,783	12,660	18,039	39,641	229	.....
Wisconsin	294,429	277,984	41,500	118,946	61,888	68,864	5,642	11,919	111,512	169,917	7,226	17,000
Wyoming	43	346	.....	.....	10	4	.....	.....	1,690	1,571	.....	.....
Total, all States	4,477,457	5,319,858	2,141,350	4,273,824	1,169,336	1,266,457	266,892	629,794	3,335,186	5,046,743	299,088	687,000

steel products by states and important steel-consuming sub-areas.

Table on pages 58 and 59 shows the tonnage distribution of each of the 11 products by geographical areas for 1940 and 1947.

Shifts Noted—Several important shifts in distribution are noted between 1940 and 1947. Detroit area,

for example, obtained only about 18.5 per cent of the 11 products in 1947, compared with almost 23 per cent in 1940. The total tonnage used in 1947, of course, was larger than the total received in 1940.

A number of southern states not only received a larger total tonnage in 1947 but also gained percentage-

wise. California's total gain is impressive, although the percentage gain may be less than many expected. For report on steel distribution policies of the Martin Committee (Steel subcommittee of the Senate Special Committee to Study Problems of American Small Business) see STEEL, Feb. 21, pp. 70-71.

PIPE						TUBING				Geographic Area*
BUTT-WELD		LAP-WELD		SEAMLESS		ELEC. WELD		MECH. & PRESSURE		
1940	1947	1940	1947	1940	1947	1940	1947	1940	1947	
3,315	20,425	779	4,315	7,166	2,697	2,899	2,804	914	538	Alabama
4,788	5,824	324	781	1,793	25,450	221	689	18	7	Arizona
3,975	7,339	953	3,704	7,091	19,895	712	29,893	159	276	Arkansas
4,846	155,982	6,712	18,447	109,405	146,603	10,894	13,313	3,590	11,453	California
6,783	12,033	731	3,172	1,991	23,412	366	42,167	1,209	715	Colorado
8,506	10,418	1,030	900	3,623	696	789	1,178	453	3,577	Connecticut
3,853	3,601	569	530	1,226	734	380	56	52	1,382	Delaware
5,046	6,903	1,330	1,009	2,244	1,365	69	213	306	83	District of Columbia
12,905	21,177	1,046	1,852	3,441	1,296	422	653	262	545	Florida
2,771	21,746	1,366	2,013	19,581	2,354	520	854	577	2,533	Georgia
2,879	3,604	185	280	202	55	5	22	12	50	Idaho
										Illinois:
54,592	75,143	5,650	10,390	13,024	18,267	8,630	17,500	5,442	24,205	Chicago area*
24,747	34,738	5,886	3,839	100,353	61,753	4,502	18,334	8,184	17,586	All other Illinois
23,273	38,458	3,898	5,074	45,440	11,193	5,563	14,357	7,201	27,666	Indiana
9,698	17,363	1,261	1,502	1,862	4,895	1,170	4,354	329	4,254	Iowa
7,491	30,452	2,523	6,904	58,913	71,942	1,399	22,430	904	3,721	Kansas
15,281	21,296	1,614	5,299	7,208	11,141	306	1,001	3,503	6,275	Kentucky
17,604	33,515	6,988	6,942	74,948	110,394	9,305	3,931	1,266	2,115	Louisiana
2,774	3,154	123	22	3,814	151	94	49	88	405	Maine
14,243	21,658	2,637	2,272	11,331	2,675	944	1,494	1,122	2,396	Maryland
20,287	28,940	2,699	3,628	3,291	2,499	4,798	5,482	2,222	5,240	Massachusetts
										Michigan:
25,405	30,978	1,890	2,555	6,970	8,075	8,989	16,146	6,276	25,724	Detroit area*
12,324	16,499	2,710	2,431	10,798	10,134	8,122	11,545	11,303	27,705	All other Michigan
14,128	17,859	1,435	1,615	2,324	4,029	884	1,829	950	3,927	Minnesota
3,666	10,564	896	593	10,355	44,557	3,262	1,238	29	939	Mississippi
15,164	27,905	1,564	2,715	30,924	21,986	1,617	14,598	1,831	6,251	Missouri
4,440	4,530	2,068	861	3,226	5,979	453	239	24	94	Montana
6,355	9,163	475	1,332	3,460	1,157	533	7,331	243	1,077	Nebraska
1,671	1,419	71	65	122	20	64	16	2	.....	Nevada
847	1,686	102	61	1,941	90	19	12	16	145	New Hampshire
34,549	59,351	6,446	11,752	10,641	6,268	987	6,563	8,394	20,918	New Jersey
3,835	7,949	1,402	3,374	11,698	50,130	485	218	1	57	New Mexico
										New York:
31,312	42,353	2,647	3,073	24,025	24,749	5,674	7,951	3,674	9,751	New York City area*
28,508	50,949	6,103	8,354	15,092	12,678	3,971	10,510	14,676	14,516	All other New York
13,789	19,417	1,074	1,066	339	680	530	704	484	723	North Carolina
1,052	1,273	34	9	33	184	2	28	26	63	North Dakota
										Ohio:
16,417	24,389	2,887	3,417	6,958	18,084	6,212	17,639	3,998	10,582	Cleveland area*
5,319	9,710	1,286	1,973	4,305	18,766	497	3,547	630	2,486	Canton-Massillon*
38,795	60,338	7,667	10,193	36,031	22,512	2,522	18,113	7,011	17,777	All other Ohio
8,560	30,563	3,396	7,001	28,700	102,174	1,996	5,685	1,079	3,679	Oklahoma
10,184	18,296	1,976	1,676	1,338	222	436	1,283	537	1,237	Oregon
										Pennsylvania:
37,112	48,090	3,380	3,270	12,559	41,947	4,371	7,631	9,553	11,531	Philadelphia area*
118,819	225,566	8,264	17,281	34,346	63,135	7,780	27,029	19,298	51,795	All other Penna.
6,692	6,567	839	837	510	271	1,886	69	16	406	Rhode Island
6,598	9,325	1,915	942	223	341	129	136	119	893	South Carolina
2,022	1,810	105	139	266	46	109	65	9	6	South Dakota
16,977	24,144	2,020	2,884	16,931	3,608	1,859	1,420	781	5,492	Tennessee
51,752	126,782	19,220	20,911	303,065	511,644	3,217	61,156	1,940	25,342	Texas
4,560	7,161	483	345	1,022	434	120	375	148	51	Utah
959	1,567	42	81	2,513	11	.....	12	25	20	Vermont
18,953	27,701	5,079	3,676	1,350	1,642	1,040	740	1,099	711	Virginia
14,617	20,140	1,108	1,637	1,098	1,255	246	965	409	1,288	Washington
30,148	52,641	2,286	2,258	28,054	30,943	1,247	9,858	2,132	4,310	West Virginia
16,552	20,659	1,738	2,739	2,100	2,096	3,885	10,573	1,565	6,147	Wisconsin
1,879	4,653	269	903	5,585	32,477	113	532	6	741	Wyoming
953,617	1,595,766	141,181	204,894	1,096,849	1,561,791	127,245	426,535	136,097	371,406	Total, all States

ALL FIGURES
NET TONS

COMBINED SHIPMENTS OF CARBON STEEL PRODUCTS by Geographic Areas

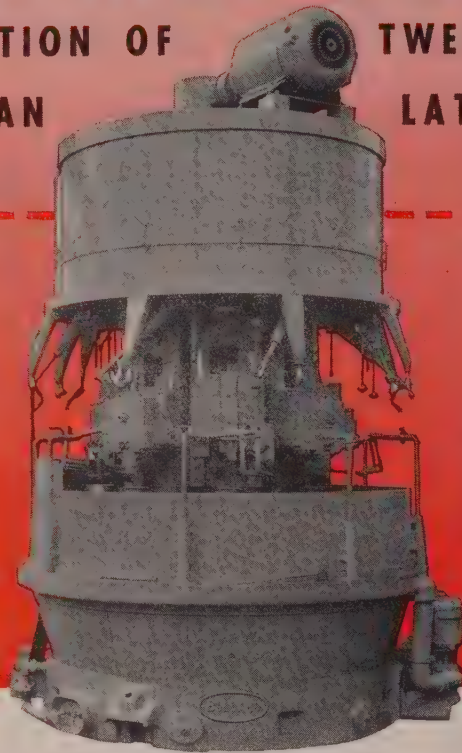
* Please turn to page
57 for explanation.

THIS ONE MACHINE

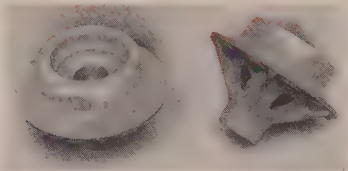
EQUALS THE PRODUCTION OF
FOURTEEN CAPSTAN

TWELVE TO
LATHES

From Coventry, England, comes this enthusiastic report of the Standard Motor Co., Ltd., on the BULLARD Type D Multi-Au-Matic.



A BULLARD Type D 8-Spindle Multi-Au-Matic used in the up-to-date plant of the Standard Motor Co., Ltd., Coventry, England. Note the compact, space-saving design.



The work. A cast differential gear case, before machining.

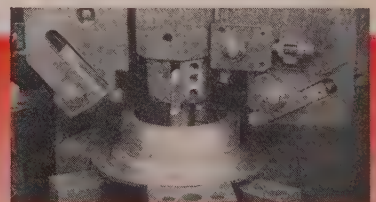
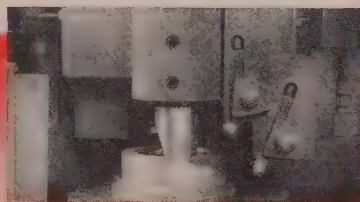


The same casting after completing one cycle (through 7 work stations) on the BULLARD machine. Arrows indicate the 12 machined faces . . . Piece time: 2 minutes!

According to a leading British automobile manufacturer, the BULLARD 8-spindle Multi-Au-Matic is an excellent example of modernization of production machinery . . . with particular emphasis on its ability to perform 12 machining operations — entirely automatically — in 2 minutes' piece time! Case histories show why BULLARD Multi-Au-Matics are internationally recognized as outstanding among multi-spindle manufacturing equipment . . . key factors in the present world-wide effort to cut the time and costs of production.

BULLARD Multi-Au-Matics are rugged versatile machines designed to cut manufacturing cost on a wide variety of jobs. These are not exclusively high production machines since case histories show reduced manufacturing costs on short runs of work. Individual speeds and feeds at each station provide correct cutting conditions for various diameters, operations and a wide variety of cutting tools. Study the manufacturing economics of the Multi-Au-Matic Method as applied to your work. The Bullard Company, Bridgeport 2, Connecticut.

Send prints of your jobs for engineering estimates. Refer to ad MD 122



Close-ups of 2 of the 7 fully automatic work stations, showing several tools cutting simultaneously.

Bonded brake linings used in all Chrysler lines and in new Chevrolets, after extensive testing on trucks. Effective lining area enlarged. Longer life claimed

DETROIT

AFTER highly successful experience covering millions of miles of service with bonded brake linings in Dodge trucks, this type of lining has been extended to the 1949 models of Chrysler Corp. passenger cars, and expectations point to at least a 33-1/3 per cent improvement in brake life. Linings are applied to the brake shoes by the "cyclebond" process, based on Chrysler's "cycleweld" adhesive bonding process developed during the war and extensively used on aircraft components. No rivets are used as in conventional brake linings, thus effecting a 15 per cent increase in effective lining area. In addition, linings can be used much longer without replacement, since as they wear down, no countersunk rivets are exposed to score brake drums, and there is no collection of dirt in lining holes to abrade drums.

A long period of testing was required to perfect a satisfactory means of bonding the lining tightly to the shoes. Many different types of adhesives, setting under heat and pressure, were investigated before a suitable type was found. Once a suitable bonding material was evolved, it then became necessary to design entirely new equipment to handle the process in mass production. Special types of merry-go-round conveyors have been installed by Chrysler to expedite production of the bonded linings and they are gradually getting into full swing as 1949 model output climbs to its prechangeover level.

Used on Chevrolet—Meanwhile, it is now disclosed, General Motors was not sitting idly by on such an important development. Its research engineers have been working for several years perfecting the suitable bonding materials and equipment for brake linings. The activity has been kept fairly quiet, while Chrysler was reaping all the credit. However, it was finally decided to take the bushel basket off the light, and the news has been released that more than 3,000,000 bonded shoe and lining assemblies already have been produced and installed on Chevrolet light trucks to prove their reliability. Evidently tests were successful, because the lin-

ings now have been extended to all passenger cars.

Why this fact was not announced along with other details of the Chevrolet line is not yet clear. At any rate, the division is now claiming another "first" for the linings, since its 1949 models were in production a few weeks ahead of the Chrysler stuff.

All Chevrolet lining-to-shoe bonding will be done at the gear and axle division in Detroit, which also will supply bonded assemblies for re-

ness, heat control and testing are enforced throughout. The first step is a thorough cleaning of components. Linings are sprayed, coated with a primer and air-dried while traveling on a conveyor. Concurrently, the steel shoe is washed, rinsed and dipped in solutions ranging from hot water to varnish. Next a chemically treated bonding tape, stored in a room at low temperature before it enters production, is inserted between the shoe and the lining. This operation is performed by a machine which automatically separates the tape from its protective coating of paper and cuts it to proper size.

The "sandwich" is assembled in a fixture designed so that a strong spring mechanism forces the lining surface outward against a retaining band. In this setup the assembly progresses through an 80-foot oven where temperatures are increased gradually to a peak of 400°F.

After cooling, the shoe is removed from the baking fixture and excess bonding materials trimmed away. Tests for resistance to shearing are carried out before the shoe is released for precision checking and installation. In the shear test, the lining is subjected to 4000-lb pressure.

K-F Builds Up Steel Sources

KAISER-FRAZER is moving ahead vigorously in its planning to insure a steady supply of steel over the next five years, unperturbed by the current sag in sales which first necessitated slowing operations to four days a week at 270 per day and then caused complete suspension of production operations for about three weeks. The suspension was described officially as dictated by manufacturing and inventory adjustments to accelerate production of two new "utility" models. However, it should also give dealers an opportunity to work off field inventories and to dispose of plant inventories of finished cars amounting to several thousand. Dealers are being offered a bonus of \$200 for every "replacement" car they order within seven days after selling a car now on their floors. This stimulant has been reinforced by an increase in dealer discounts of around 6 per cent.

To Build New Open Hearth—There are some angles on the K-F Cleveland blast furnace property and a recently negotiated two-way working agree-

Automobile Production

Passenger Cars and Trucks— U. S. and Canada

	1949	1948
January	459,260	422,236
February		399,471
March		519,154
April		462,323
May		359,996
June		454,401
July		489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

Estimate for week ended:

	1949	(Same week) 1948
Feb. 5	104,450	82,717
Feb. 12	108,911	83,996
Feb. 19	113,382	110,536
Feb. 26	116,000	120,130

Ward's Automotive Reports

placement purposes to avoid imperfections in field servicing. In the past two years, several types of equipment have been offered to brake service stations for bonding linings, and apparently Chevrolet has decided to hold on to replacement business until there is more standardization of procedures.

Bonding Exact Procedure—Fourteen steps are involved in manufacturing the bonded linings at Chevrolet. Exacting standards of clean-

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PLAN HANDLING SESSION: Materials handling specialists from seven Detroit area companies are planning a panel discussion on materials handling for the national passenger car meeting of the Society of Automotive Engineers in Detroit Mar. 8. Clockwise around the table are: Joseph Geschelin, chairman of the SAE production program committee; W. J. Dernberger, Ford Motor Co.; E. B. Thurston, Haughton Elevator Co., Toledo; C. P. Whiteley, Automotive Transport Co., Chicago; Otie Parmenter, Parmenter Steel & Conveyor Co.; R. R. Shelton, Mechanical Handling Systems Inc.; R. K. Degener, Equipment Mfg. Co.; and O. E. Johnson, Kaiser-Frazer Co.

ment with Republic Steel which are of interest. When K-F first acquired the furnace, it became apparent its unscrambling from Republic-owned properties was going to be a tedious and costly proposition, so after lengthy discussions it was agreed Republic would go ahead with construction of a new open-hearth furnace to be located at one end of the present battery of 12 furnaces at the Corrigan-McKinney Division in Cleveland. Other changes will involve speeding up a skin pass mill and alterations to manipulators and coil handling equipment. For this work, scheduled for completion by July, K-F is making a "contribution" of \$2,375,000 and in return will receive an option on 7000 tons of cold-rolled sheet, starting in August, plus 12,000 tons of pig iron a month at the market prices for the next five years. While expenditure of this sum on the face of it might seem overly generous on the part of the automaker, when it is weighed against the cost of unscrambling the facilities necessary to operate the blast furnace independently, the investment may not be excessive.

Furthermore, the K-F contract with Portsmouth Steel Corp. for 7000 tons of sheet per month at a negotiated price expires June 30 and the Republic option on sheets will fill this shortage nicely, although there will be an interval of about one month between expiration of the Portsmouth contract and the receipt of the first sheets from Cleveland.

Finances New Electric Furnace—Kaiser-Frazer concurrently has negotiated a complicated agreement with

Allegheny Ludlum Steel Corp., Brackenridge, Pa., for the construction of a 60-ton electric furnace which will be operating by July 1, producing 4000 tons of ingots monthly. The furnace is one of four which Allegheny is building and will operate on a similar basis for different customers. Funds advanced for building the furnace will be credited against ingots received, and K-F in turn will supply some of the scrap requirements.

The current suspension of operations at Willow Run has meant that steel intake has been considerably on the plus side, but the company reports it has had no difficulty disposing of tonnage to outside buyers—in fact these purchasers have been "kicking the door down," seemingly refuting widely circulated claims of an easing-off in steel buying.

New Dodge Specifications

GLEANINGS from specifications released for 1949 Dodge models, of interest to the metalworking industry: Massive sheet metal fender sections have been avoided, fender units are bolted on and, if necessary, can be replaced at minimum inconvenience and cost. Stainless steel grille is given a "flash" chromium plate to retard tarnishing and to match with other bright metal trim. Adjustable front seat springing permits additional spring units to be installed to suit individual needs. Stationary footrest for rear seat passengers is scientifically placed for proper support, and rear seat legroom is not altered by the 5-inch travel adjustment of

the front seat. Firmer setting of the hand brake with less effort results from the use of a double pawl locking mechanism which gives the effect of twice the number of ratchet teeth and reduces the pull necessary to lock the brake. Fluid drive is supplemented with an optional "gyro-matic" two-range automatic transmission, an improved version of that offered previously on Chrysler and DeSoto.

Highlights on Desoto

A FEW of the highlights of the 1949 DeSoto include: Smoother accelerator-pedal action is achieved through improved linkage and pedal construction which eliminates sliding friction through the floor. Radiator top tank fitting is changed from a malleable casting to a short straight brass tube, with distributing baffle added to the tank. Heavier over-center spring and low-friction linkage at the spring connection, utilizing a rolling action, provides smoother clutch disengagement. Shock absorbers at the rear are inclined toward the center of the chassis, eliminating the need for a rear transverse strut. Longer front spring life is obtained by increasing static height of the spring 1¼ inches. Three-tooth roller gear replaces a two-tooth gear in the steering mechanism which is of the center-point type this year (larger tires have introduced the need for reduced steering effort on most current models). Greater frame strength is provided at the front bumper attachment by the addition of a reinforcement plate. Easier servicing and greater dependability of operation are afforded by a more compact starter unit, embodying an over-running clutch of concentric construction, with forged and hardened cams. Convenience of electrical switch operation is aided by rotary-action dustproof units for headlights, panel lights and heater, replacing push-pull type.

2600 Job Classifications

RECENT check has revealed over 2600 job classifications in automobile plants, of which about 10 per cent are on final assembly lines alone. One company has more than 90 classes of jobs on assembly, plus 160 in machine operation, 50 in press plants, 75 in forging, 40 in welding and 160 in foundry work. There are reported to be some 1100 jobs of a nonproductive character in the larger motor plants, including tool and die makers, maintenance, inspection, engineering, machine setting, materials handling and others. Salaried employees may fall into as many as 600 independent classifications.

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Company's Activity Changes

International Detrola finds its steel production exceeding fabrication business in importance

INTERNATIONAL Detrola Corp., forced in 1946 to make its own steel to sustain output of its many metal products, now finds that almost 47 per cent of its business comes from steel, plans to increase this proportion, will dispose of several non-steel operations and proposes to change its name to Newport Steel Corp.

Net sales from steel account for 46.84 per cent of Detrola's total net sales; radio accounts for 23.69 per cent; aircraft 13.61 per cent; refrigeration 13.60 per cent and machinery 2.26 per cent. In 1946 the company entered the steel business with the purchase of plants of Andrews Steel Co. at Newport, Ky. In 1947 Detrola purchased Wheeling Steel Co.'s blast furnace at Martins Ferry, O.

Along with the increased importance of steel in International Detrola's business has come the more minor role played by some of the company's manufactured products. Refrigeration Division sales fell sharply, were only 13.60 per cent of total net sales for fiscal 1948 compared with 28.03 per cent for the previous year. The company has discontinued manufacture of home radios and phonographs, which had been made in Detroit, and consolidated all other electronic activities to Huntington, Ind. It also sold its inventory and equipment related to manufacturing automobile radio receivers to Motorola Inc., Chicago.

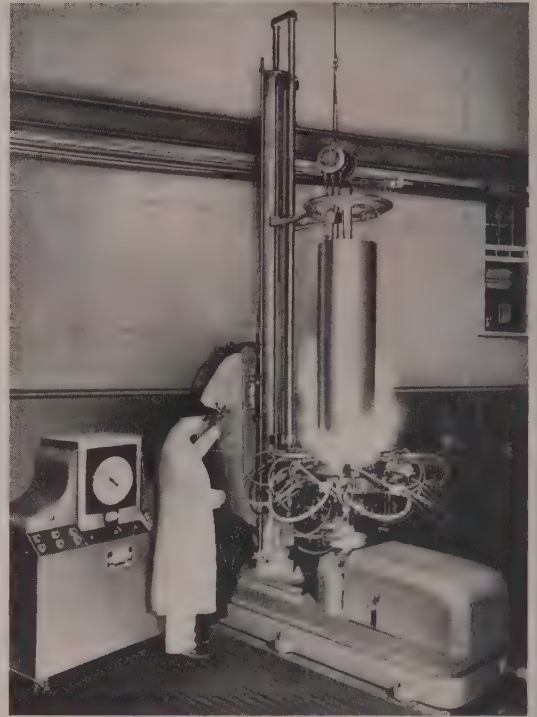
International Detrola has its origins with Foster Machine Co., formed at Elkhart, Ind., in 1909. In 1941, following an amalgamation of Foster and International Machine Tool Co., Indianapolis, International Machine Tool Corp. was formed. The present title was adopted in 1943 after merger of International with Detrola Corp., Detroit.

Net profit of the company for the fiscal year ended Oct. 31, 1948, was \$1,710,083 on sales of \$69,314,488, compared with earnings of \$1,379,139 in 1947 on sales of \$71,682,179.

Sheet & Tube To Spend \$2 Million

IMPROVEMENTS totaling about \$2 million have been approved by the board of directors of Youngstown Sheet & Tube Co., Youngstown. Installation of three heavy duty cranes at the Indiana Harbor, Ind., open-hearth plant will cost about \$1,250,000 and some additional work will be

FLAME HARDEN-ER: Positive control for all four perfected methods of flame hardening — rotary progressive, vertical progressive, spinning and combination—are claimed for this automatic, electronically controlled Denver flame hardener, just installed by Lakeside Steel Improvement Co., Cleveland steel treating firm. The equipment makes possible quick case hardening of finish-machined parts without scaling or distortion



done on the plant buildings. The company hopes to get 225 to 230-ton heats as a result of the increased crane capacity. The old cranes will be reconditioned and installed at the Campbell Works, in Youngstown. Another major project is the rebuilding of the coal washer at Buckeye Coal Co.'s Nemaocolin, Pa., mine at a cost of about \$700,000.

Mack Expands Motor Plant

STRUCTURAL work on the four new industrial buildings of the motor assembly plant for International Plainfield Motor Co., a subsidiary of Mack Truck Corp., in Plainfield, N. J., is nearing completion.

The project includes a three-story assembly building with offices, a motor test unit, a shipping facility and an extension of the present machine shop.

National Tube Gets 13 Furnaces

NATIONAL TUBE CO., a U. S. Steel subsidiary, has completed installation of 13 new furnaces at its Gary, Ind., plant for heating pierced seamless steel tubes so that they can be rolled to specified sizes.

Tube sections pass through the battery of furnaces at speeds up to 240 feet a minute, emerging with a temperature of 1800° F. The furnaces are constructed to accommodate

tubes up to 45 feet long and 3 to 9 inches outside diameter.

The reheating furnaces are used in conjunction with a huge rotary billet heating furnace. An additional seamless mill is to be built soon at Gary.

New Association Formed

ASSOCIATION of Sprinkler Irrigation Equipment Manufacturers has been formed with headquarters at Ridgewood, N. J. Everett H. Davis, Irrigation Equipment Co., Eugene, Oreg., was elected president of the association.

Prizes for Welding Papers

RESISTANCE Welder Manufacturers' Association, Philadelphia, will make six prize awards totaling \$2250 for the best papers on designing for, application of and research in resistance welding submitted to the American Welding Society prior to Aug. 1, 1949. First prize for the best paper from an industrial source will be \$750 and second and third best papers will be awarded prizes of \$500 and \$250, respectively.

Author of the best paper submitted by a university instructor, student or research fellow will receive \$300, with \$200 for the second best paper. A new prize of \$250 for the best paper by an undergraduate student has been added this year.

Briefs . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Illinois Tool Works, Chicago, has appointed K. P. Wesseling Co., St. Louis, exclusive sales representative in the St. Louis area for its line of cutting tools, including hobs, broaches, shaper cutters and milling cutters.

Thor Corp., Chicago, manufacturer of home laundry appliances, is temporarily closing its El Monte, Calif., assembly plant. During the closedown, appliances sold on the West Coast will come from the main plant.

National Security Resources Board predicts an increase in the sales of gas by utilities from 3098 billion cu ft in 1947 to 4629 billion cu ft in 1952. The survey indicates that sales would greatly exceed this figure if the gas industry could obtain sufficient pipeline steel to meet increasing demands.

American Trucking Associations Inc., Washington, reports its truckloading index reached an all-time high of 230 in 1948, compared to 206 in 1947. Motor carriers transported an aggregate of 2,572,410 tons in December as compared with 2,626,142 tons in November.

General Electric Co., Schenectady, N. Y., announces expansion of its Salt Lake City, Utah, facilities for repair, maintenance and warehousing of equipment used by mines, smelters, power companies and others in the area.

Permanente Metals Corp., Oakland, Calif., through its sales affiliate Permanente Products Co. has opened its aluminum wire and cable production schedules to all uses of aluminum electrical conduction. Firm's Newark, O., mill, with a capacity of 15 million pounds of conductor quarterly, can begin delivery in the fourth quarter of 1949.

Reltool Corp., manufacturer of metal cutting tools, has purchased a new plant in Milwaukee and is moving its main office to the site, 4540 W. Burnham St. The new unit will give Reltool an additional 20,000 sq ft of floor space.

Snyder Tool & Engineering Co., Detroit, builder of production machines for the automotive and similar industries, has purchased Arthur Colton Co., Detroit, maker of production ma-

chines for the drug, plastics and packaging industries. The Colton name will be retained, but its manufacturing activities will be transferred to the Snyder plant.

Hydro-Line Mfg. Co., Rockford, Ill., manufacturer of air and hydraulic cylinders and special machinery, has appointed C. E. Gobeil Co., St. Paul, as a representative in Minnesota, North and South Dakota and southwestern Wisconsin.

Govro-Nelson Co., Detroit, manufacturer of automatic drilling and tapping units, has enlarged the scope of its operations to include the designing and building of complete machines incorporating drilling and tapping units for performing several operations at one time.

NEW VALVE DIVISION

MINNEAPOLIS-Honeywell Regulator Co., Minneapolis, will acquire **H. Belfield Co.**, Philadelphia, manufacturer of control valves. **Howard L. Murray**, president of Belfield, will be elected a vice president of Minneapolis-Honeywell and will be in charge of the new Belfield Valve Division.

Kieley & Mueller Inc., North Bergen, N. J., manufacturer of pressure and control specialties and related equipment, has appointed **Richard Barthlemess Sales Co.**, Jacksonville, Fla., as sales agent in Florida.

Fredric Flader Inc., North Tonawanda, N. Y., and **Clark Bros. Co. Inc.**, Olean, N. Y., have organized and will jointly own **Flader-Clark Corp.** to develop industrial application of new principles of power propulsion.

Acro Electric Co., Cleveland, has changed its name to **Acro Switch Co.** New directors are **W. F. Rockwell**, **W. F. Rockwell Jr.**, **F. P. Maxwell**, **Arthur Kroeger** and **F. G. McCloskey**.

War Assets Administration has sold two adjoining surplus plants in South Bend, Ind., to **Bendix Aviation Corp.**, Detroit. Plants were operated by Bendix during the war and the firm is currently manufacturing aircraft

landing gear and fuel metering devices at these locations.

Koehring Co., Milwaukee, has established a West Coast Division with manufacturing facilities in Stockton, Calif. The plant which occupies 36,000 sq ft will be used for production of steel subassemblies and weldments used by Koehring and its subsidiaries and for final assembly of equipment destined for use in the western area.

Reynolds Metals Co., Richmond, Va., has designated **Kasle Steel Corp.**, Detroit, as its aluminum distributor in the Michigan area.

Wean Equipment Corp., Cleveland, has concluded an agreement with **Joshua Eigwood & Son Ltd.**, Wolverhampton, England, for exclusive rights to manufacture and sale of Bigwood tube, bar and shape straightening machinery.

Scully-Jones & Co., Chicago, manufacturer of production tools, announces the formation of an Engineering and Service Division offering help regarding operational procedure; methods, engineering and processing; and tool and machine design.

American Cladmetals Co., Carnegie, Pa., has appointed **Pacific Metals Co. Ltd.**, with offices in Los Angeles and other western cities, as exclusive sales agents of its cladmetals in California, Arizona, Nevada and Utah.

Russell Mfg. Co., Middletown, Conn., has named **Klinger-Dills Co.**, Dayton, O., as exclusive distributor for its Belting Division, including Rusco conveyor and transmission belting and endless high speed belts.

Tennessee Coal, Iron & Railroad Co., Birmingham, U. S. Steel subsidiary, has removed its **Ensley Blast Furnace No. 4** from operation for relining and complete overhauling. Furnace was taken from blast on Feb. 12 and will be down for an estimated 55 days.

Plasteel Products Co., Washington, Pa., announces that **Dr. J. E. Rosenberg**, president, has acquired complete control of the plant and facilities of the firm. Operations will continue under the same name, but an immediate expansion program is being planned.

Clingan & Fortier Inc., San Francisco, warehousing firm for steel and aluminum, has opened a branch at 1960 H St., Fresno, Calif.

The Business Trend

INDUSTRIAL production continued its gradual ascent in the week ended Feb. 19 as STEEL's industrial production index rose another point from the preceding week and reached 172 per cent (preliminary) of the 1936-1939 average. The level for the latest week is 6 points higher than for the same week a year ago.

AUTOMOBILES—Gaining additional momentum from week to week as the Big Three of the industry get their production lines moving at a faster pace, production in the automobile industry continues to climb and helps push the industrial production index upward. During the week ended Feb. 19, outturn of passenger cars and trucks reached 113,382 units, more than 4000 above the preceding week's total. Some of the independent builders did not have smooth sailing, however, as their totals were cut by steel and parts shortages and labor disputes.

STEEL—Output of steel for ingots and castings was at 100 per cent of capacity during the week ended Feb. 19, marking the third consecutive week of operations at this rate. Tonnagewise, operations aggregated about 1,843,500 tons to add to an imposing total for the year to date.

COAL—With heavy stocks of coal on hand in the U. S., mining interests have recommended to Congress that 2 million tons of bituminous coal be exported monthly under ERP to offset the domestic surplus. Members of the Senate Foreign Relations Committee did not appear to be favorably inclined to

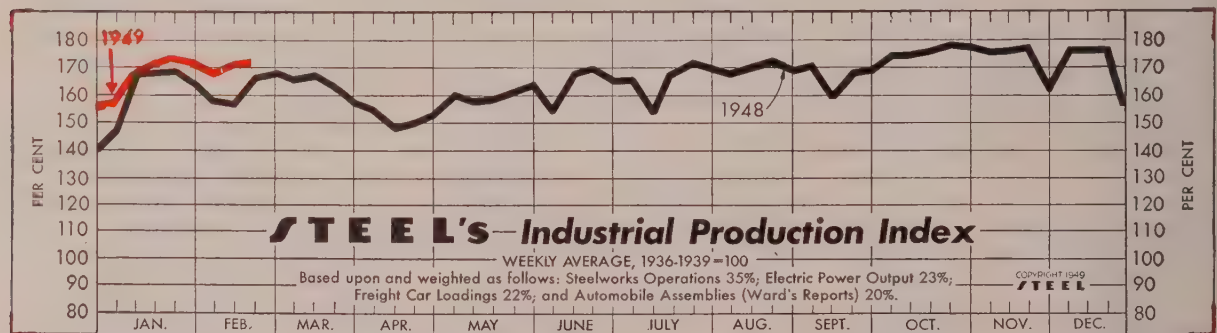
the proposal and the industry appears unlikely to get this prop for their sagging market. Production for 1949 to Feb. 12 is more than 9 million net tons below the corresponding period last year.

RAILROADS — Association of American Railroads estimates that railroad operating revenues in January decreased 2.7 per cent as compared with the same month in 1948. Operating revenue for the latest month is estimated at \$594.3 million and actual operating revenue for January, 1948, was \$610.8 million.

BUSINESS—Business failures in January amounted to 566, up 6 per cent over the preceding month and almost 60 per cent above a year ago. The total was the highest in any month since November, 1942. Although the liabilities involved in January failures declined to \$19,159,000 from \$31,731,000 in December, they exceeded those in any January since 1939.

CONSTRUCTION—Civil engineering construction volume totaled \$146.6 million for the week ended Feb. 17. This volume is 12 per cent above the preceding week and 66 per cent above the corresponding week last year. Cumulative total for the first seven weeks of 1949 is \$1,053,288,000, which is 53 per cent higher than for the corresponding total in 1948.

PRICES—Average primary market prices advanced 1 per cent in the week ended Feb. 15, almost offsetting the decline of the previous week, according to the Bureau of Labor Statistics. The index is at 158.5 per cent of the 1926 average, 0.9 per cent below the level of the same week a year ago.



Index (chart above): Week ended Feb. 19 (preliminary) 172 Previous Week 171 Month Ago 173 Year Ago 166

BAROMETERS of BUSINESS

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	100.0	100.0	100.0	93.5
Electric Power Distributed (million kilowatt hours)	5,740‡	5,722	5,769	5,254
Bituminous Coal Production (daily av.—1000 tons)	1,908	1,893	1,980	1,872
Petroleum Production (daily av.—1000 bbl)	5,350‡	5,330	5,419	5,342
Construction Volume (ENR—Unit \$1,000,000)	\$146.6	\$131.2	\$96.6	\$88.6
Automobile and Truck Output (Ward's—number units)	113,382	108,911	113,820	110,536

* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons. ‡ Preliminary.

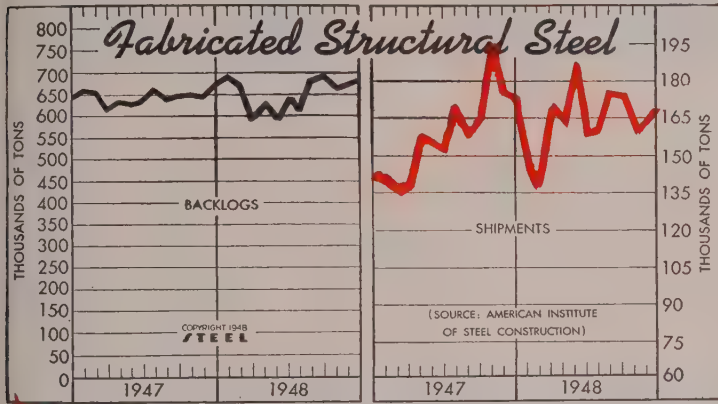
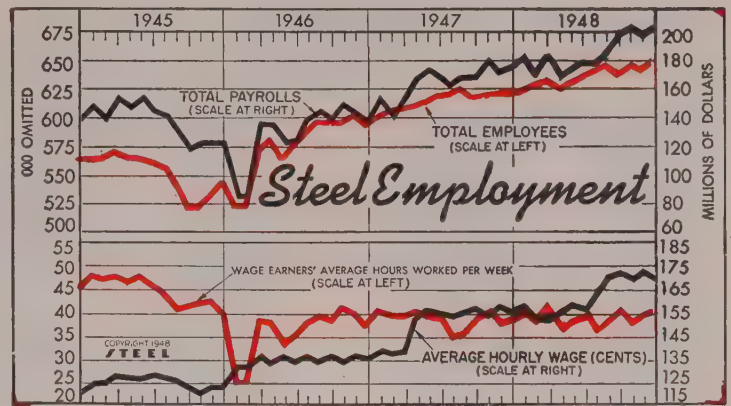
TRADE

Freight Carloadings (unit—1000 cars)	703†	699	710	805
Business Failures (Dun & Bradstreet, number)	180	192	142	107
Money in Circulation (in millions of dollars)‡	\$27,480	\$27,557	\$27,717	\$28,053
Department Store Sales (changes from like wk. a yr. ago)‡	none	-4%	+5%	-3%

† Preliminary. ‡ Federal Reserve Board.

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1948	1947	1948	1947	1948	1947
Jan. ..	622	601	\$180.2	\$155.8	157.3	138.1
Feb. ..	626	607	167.6	139.5	155.1	137.0
Mar. ..	629	609	183.0	150.6	154.8	137.9
April ..	626	611	168.5	168.3	155.1	153.3
May ..	628	615	175.3	175.8	157.7	155.6
June ..	634	623	179.5	167.6	156.9	154.7
July ..	641	623	179.8	163.2	164.5	153.9
Aug. ..	645	625	193.8	169.1	168.9	155.6
Sept. ..	641	618	199.4	168.9	171.8	157.1
Oct. ..	644	620	201.7	180.1	169.9	154.6
Nov. ..	646	624	199.8	171.0	172.1	158.7
Dec. ..	648	621	205.8	175.3	169.4	156.5



Fabricated Structural Steel

	(000 Tons)			Backlogs		
	1948	1947	1946	1948	1947	1946
Jan.	146.4	140.6	107.5	692	661	552
Feb.	141.6	136.1	63.8	673	656	551
Mar.	167.0	137.8	102.8	597	614	605
Apr.	166.7	157.4	122.5	630	632	674
May	186.9	155.0	124.4	593	628	615
June	157.1	151.9	126.8	647	634	642
July	160.8	169.9	140.2	613	661	674
Aug.	176.3	158.0	157.5	691	639	651
Sept.	175.0	164.3	141.9	698	648	682
Oct.	164.0*	196.1	164.7	669	649	660
Nov.	169.8*	175.0	157.3	673	645	665
Dec.	182.4	173.0	142.1	670	671	646

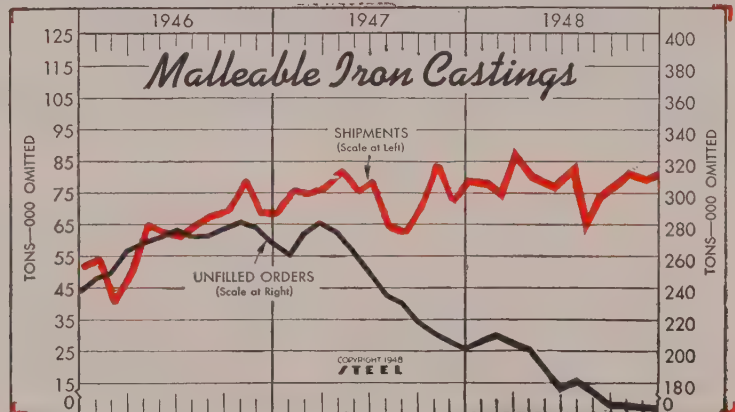
Total 1,993.9 1,915.1 1,551.6

* Revised.

Malleable Iron Castings

Unfilled orders
for castings
for sale

	Shipments (000 omitted)		Unfilled orders for castings for sale (000 omitted)	
	1948	1947	1948	1947
Jan.	77.7	75.9	206	260
Feb.	75.2	74.7	209	274
Mar.	86.8	76.6	203	281
Apr.	80.6	81.9	200	275
May	76.1	75.5	192	202
June	81.7	78.5	179	249
July	64.9	64.2	180	235
Aug.	73.3	62.4	177	230
Sept.	77.8	71.6	164	218
Oct.	81.8	84.0	158	211
Nov.	77.2	72.1	146	206
Dec.	79.9	77.8	137	202
Total	933.1	895.1	...	...



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	\$12,711	\$12,568	\$13,731	\$12,854
Federal Gross Debt (billions)	\$252.6	\$252.5	\$252.3	\$254.8
Bond Volume, NYSE (millions)	\$14.4	\$16.4	\$19.5	\$16.5
Stocks Sales, NYSE (thousands)	3,908	5,033	4,107	3,770
Loans and Investments (billions)†	\$62.2	\$62.7	\$62.6	\$64.4
United States Gov't. Obligations Held (millions)†	\$33,016	\$33,268	\$33,324	\$36,791

† Member banks, Federal Reserve System.

PRICES

	\$97.77	\$97.77	\$97.77	\$81.14
STEEL's Composite Finished Steel Price Average	\$97.77	\$97.77	\$97.77	\$81.14
STEEL's Nonferrous Metal Composite‡	232.6	232.6	232.6	189.5
All Commodities†	158.5	156.9	159.3	159.9
Metals and Metal Products†	178.1	178.3	175.3	155.6

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.

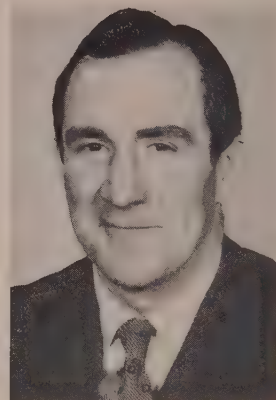
Men of Industry



EUGENE G. SHEASBY



DR. THOMAS H. DAUGHERTY



MELVIN M. JOHNSON JR.

Eugene G. Sheasby has been appointed general staff manager, General Sales Division, United States Steel Supply Co., Chicago warehousing subsidiary of U. S. Steel Corp. He has been manager of the Market Development Division for the past year.

—o—

Barium Steel Corp., New York, announces appointment of Eugene A. Lehmann as vice president and general manager of its subsidiary, Globe Forge Inc., Syracuse, N. Y., succeeding E. Lawton Bishop, resigned. Mr. Lehmann has 30 years of drop forging experience, having served with Park Drop Forge Co., Cleveland, Aluminum Co. of America in Cleveland, Aluminum Forgings Inc., Erie, Pa., and since 1946 as assistant manager in charge of the Melvindale plant of Timken-Detroit Axle Co.

—o—

Russell F. Stuart, for 13 years head of the Eastern sales activities of Kearney & Trecker Corp., Milwaukee, has been appointed sales manager for the company's Walker-Turner Division at Plainfield, N. J., which makes light machine tools for industrial and home workshop application.

—o—

Henry C. McCaslin has been appointed general purchasing agent of Willys-Overland Motors Inc., Toledo, O., and Wesley H. Lowell has been appointed purchasing agent in charge of raw materials. Thomas O. MacDonald has been appointed purchasing agent in charge of castings, forgings, patterns and dies, and George H. Kraus, assistant to the director of procurement.

—o—

Vincent A. Schmidt, since 1940 pro-

duction manager of Baker Bros. Inc., Toledo, O., machine tool and machinery builder, has joined the Nelson Stud Welding Division of Morton-Gregory Corp., Lorain, O. He will represent the stud welding organization as field engineer in northwestern and central Ohio and northeastern Indiana, and will have offices at Toledo.

—o—

Dr. Thomas H. Daugherty has been named assistant director of research for Calgon Inc., Pittsburgh, and C. E. Kaufman has been appointed assistant director of chemical research, Hall Laboratories Inc., an affiliated company.

—o—

Metalwash Machinery Corp., Irvington, N. J., announces opening of its Michigan office in Detroit, with Webb L. Nimick in charge. Mr. Nimick, formerly an engineer stationed at the company's main office in Irvington, will represent Metalwash in Michigan, and will be available for consultation and information regarding all types of metal cleaning equipment.

—o—

Robert J. Donnelly has been appointed general sales manager, Ward K. Stallings, chief engineer, and A. W. Bailey, general office manager of Kieley & Mueller Inc., North Bergen, N. J., manufacturer of automatic control valves.

—o—

Richard E. Hitchcock has been appointed as field engineer and sales representative for the New York area of Hannifin Corp., Chicago, manufacturer of hydraulic and pneumatic production equipment and specialties. He was formerly East Coast sales

engineering representative for Bendix Products Division, Bendix Aviation Corp., Detroit.

—o—

Melvin M. Johnson Jr., designer and manufacturer of automatic rifles, has joined Winchester Repeating Arms Co., New Haven, Conn., division of Olin Industries Inc., which has taken over all firearms patents of Johnson Automatics Inc., Boston, of which Mr. Johnson has been president and technical director. The latter company, along with Johnson Automatics Mfg. Co., of which Mr. Johnson also was president, has abandoned military arms production, and will concentrate on building construction work on the West Coast with Latisteel Inc., a California subsidiary.

—o—

Ray S. Larsen has been appointed sales manager of Despatch Oven Co., Minneapolis, and will be in charge of sales of finishing systems, washers, spray booths, foundry ovens and industrial heat treating equipment.

—o—

Cecilco Co., Cleveland, corrosion proofing specialist, has appointed Leo E. Gatzek as district manager for the Chicago territory. He has been with the Manufacturing Research Division of International Harvester Co., Chicago, for some time.

—o—

Roy E. Jones has been appointed export manager, Link-Belt Co., Chicago, and will have headquarters in New York. He succeeds Carl A. Woerwag, retired due to ill health. Mr. Jones was formerly assistant export manager.

—o—

Philip W. Ruppert has been appointed assistant manager of the Chicago

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1. Resistance to Rust and Corrosion

2. Resistance to High Temperatures

3. Non-Magnetic

4. Non-Sparking

5. Re-Usable

6. Attractive Appearance

7. Easy to Clean

8. High Strength

9. Long Life

10. Lower Ultimate Cost

11. Resistance to Fatigue

12. Easy to Plate or Finish

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6000 INDIVIDUAL ITEMS IN STOCK

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branch of National Lead Co., New York. He was a member of the metal sales department, Chicago. **Durward G. Hoffman** has been named comptroller of the Cleveland branch of the company, succeeding **Edward W. Benson**. He has been acting assistant comptroller of that branch.

—o—

George A. Grantham, formerly of Worcestershire, England, has been appointed chief engineer of Weddell Tools Inc., Rochester, N. Y., manufacturer of metal cutting tools. Before coming to the United States in 1948, Mr. Grantham was associated with Messrs. Richard Lloyd Ltd., manufacturer of inserted blade cutting tools, as assistant to the managing director covering the field of development. He has been connected with Kelsey-Hayes Wheel Co. and Ford Motor Co., England, in the capacities of assistant chief engineer and chief of tool design.

—o—

John C. Alberts has been appointed factory sales representative of the Machine Division, Osborn Mfg. Co., Cleveland. He has been assigned to the northern Indiana, Illinois, Iowa, Wisconsin and Minnesota area, and will make his headquarters in the Chicago office.

—o—

Bernard R. Better has been appointed director of research for Scully-Jones & Co., Chicago. Mr. Better, who has been with the company since 1939, has been responsible for development and standardization of many of its production tools.

—o—

Lyle H. Harvey has been elected executive vice president and general manager of Parsons Corp., Detroit. He was director and treasurer of Parsons Co. and treasurer of Parsons Industries Inc., Traverse City, Mich., which have merged to form the Par-

sons Corp., with general offices at Detroit. The automotive stamping plant is now called the Automotive Division, and the Pureaire kitchen and aircraft plant in Traverse City will be known as the Appliance Division and Aircraft Division, respectively. **John T. Parsons**, former president, Parsons Industries, becomes vice president in charge of aircraft, automotive sales and product engineering. **Thorsten Benton**, former vice president of Parsons Industries, is secretary of the new corporation and manager of operations at Traverse City. **John A. Rishel Jr.** and **Ford Fisher** continue as Appliance Division sales manager and sales promotion manager, respectively. **Axel Brogren** is master mechanic of all divisions. Appointments in the Automotive Division include: **Elmer C. Rumley**, manager of operations; **Fred Schmidt**, factory manager; **Harold E. Nofz**, sales manager; and **Willard Brown**, purchasing agent. Appointments in Traverse City include: **Lyman Hermanson**, production superintendent, Appliance Division; **James Van Wack**, purchasing agent; **Adrian G. Weaver**, production superintendent, Aircraft Division; and **Frank L. Stulen**, director of research and development, Aircraft Division.

—o—

Buick Motor Division, Flint, Mich., General Motors Corp., announces **O. W. Young**, general manufacturing manager, has been named executive assistant to the general manager, a newly created position; **E. T. Ragsdale**, assistant chief engineer, has been appointed to succeed Mr. Young as general manufacturing manager; and **Harry C. Doane** and **Richard C. Cook** have been appointed assistant chief engineers, to serve under **Charles A. Chayne**, Buick's chief engineer.

—o—

Sam Tour & Co. Inc., New York, an-

nounces reorganization of its mechanical engineering department under the supervision of **John J. Meadows**, who recently joined the organization. For the past five years he has been engaged in consulting work. Mr. Meadows served with Otis Elevator Co., nine years with the Board of Transportation, and four years in the engineering department of the New York Central Railroad.

—o—

Continental Foundry & Machine Co., East Chicago, Ind., has announced the promotions of **David Lyle** as vice president of engineering, and **F. B. Streine** as assistant vice president of engineering sales, of the rolling mill and heavy machinery. They will be located in the Pittsburgh sales and engineering offices.

—o—

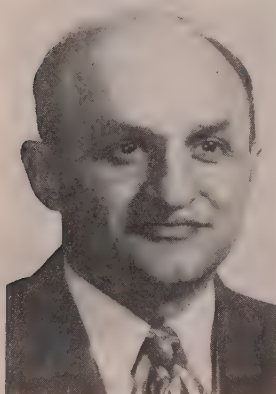
J. R. Elder has been appointed field representative for Tomkins-Johnson Co., Jackson, Mich. He will serve in a general sales and service capacity in the field, tying in his work with the company's representatives located in principal cities. Mr. Elder formerly was associated with Kalamazoo Stove Co., Kalamazoo, Mich., for a number of years, and also with Industrial Tool Engineering Corp., Taunton, Mass.

—o—

Emil Gairing, president, Gairing Tool Co., Detroit, has been elected president of the Cutting Tool Manufacturers' Association, succeeding **D. E. Van Deusen**, president and general manager of Kelly Reamer Co., Cleveland. **Norman Lawton**, works manager, Star Cutter Co., Detroit, was elected vice president; **R. S. Spencer**, president, Detroit Boring Bar Co., was elected treasurer; and **Harry J. Merrick** continues as executive secretary of the association.

—o—

Prof. J. W. Hubler, head of the civil engineering department, Washington



BERNARD R. BETTER



E. T. RAGSDALE



EMIL GAIRING

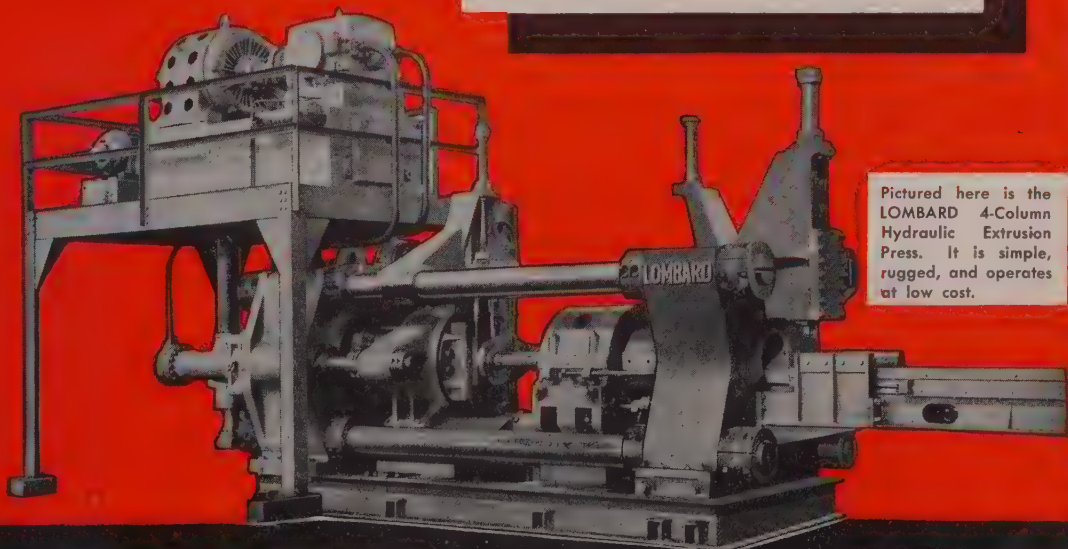
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FIER SYSTEMS • COMPLETE PLANT
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University, St. Louis, has joined the Steel Joist Institute, Washington, as consulting engineer. He succeeds **Frank Burton**, who, after 20 years' service with the institute, has gone into private business in Detroit. Prof. Hubler will have charge of research and will be available for consultation by the institute on industry problems, designs, standards, etc., and in this work will have at his disposal the research facilities at Washington University.

F. H. McGraw & Co., Hartford, Conn., announces election of **Urban D. Gosselin**, formerly assistant to the president, as vice president; **Harry W. Mathews**, project manager, as assistant to the president; and **Frank J. McClean**, formerly secretary, as controller. Messrs. Gosselin and McClean will continue to work out of the Hartford office, and Mr. Mathews, construction superintendent on the coal preparation plant which the company is building for Jones & Laughlin at East Fredericktown, Pa., will remain on that project until it is completed and ready for operation this summer.

Following completion of a special training program, Bailey Meter Co., Cleveland, has assigned the following field engineers to their respective branch offices: **R. E. Byers**, St. Louis; **N. P. Campbell**, San Francisco; **G. F. Fitzpatrick**, Denver; **R. A. Homan**, Pittsburgh; **T. A. Melton**, Charlotte, N. C.; **W. G. Thiemann**, New York; **J. F. Kontz**, Cleveland district office; **G. H. West**, Atlanta; **N. S. Wilson**, Philadelphia; **M. G. Johnson**, Houston; and **R. P. Marche**, Chicago. **R. E. Ellis** and **W. H. Robbins** have been assigned to the engineering department, **R. E. Hartman** and **R. E. Paulson** to the sales department, **A. L. Wade** to the patent department, and **F. S. Holby** to the research department in Cleveland.

L. A. Pech has returned to Herrick Iron Works, Oakland, Calif., as vice president in charge of sales after an absence of four years. During his absence he was general manager of sales for Judson Pacific-Murphy Corp.

John M. Floyd, vice president in charge of manufacturing, A. O. Smith Corp., Milwaukee, has been elected a director of Briggs & Stratton Corp., Milwaukee, filling a vacancy on the board.

Waukesha Motor Co., Waukesha, Wis., announces election of **Charles E. Nelson** as vice president in charge



W. F. BRAZEAU

Elected president, Instel Metals Corp., New York, formed as an affiliate of International Selling Corp., of which Mr. Brazeau is also president. Noted in STEEL, Jan. 31 issue, p. 44

of production, and **John G. Swain** as vice president in charge of sales. **Frederick C. Schulze** has been appointed sales manager of the company.

New officers elected by Abdite Gauge Co., Dearborn, Mich., are: **Arnold Kaiander**, president; **Steven Coloske** and **Oliver Laszlo**, vice presidents; **Stanley Czarnik**, secretary and treasurer.

Black, Sivalls & Bryson Inc., Kansas City, Mo., announces that **Benjamin W. Bourne**, sales engineer, has been transferred to the Midland, Tex., sales office. He formerly was in charge of the New Orleans office, and **C. W. Hayes**, engineer at Kansas City, Mo., has been appointed to take temporary charge of that office. **James R. Banks**, sales engineer formerly connected with Townsco Equipment Co., Oklahoma City, Okla., will also be stationed at the New Orleans office. **Raymond D. Canada** has been transferred from the Kilgore, Tex., branch office, to assume management of the sales office at Magnolia, Ark., recently opened by the company. **Floyd C. Myers**, regional sales manager, has transferred headquarters from the Lubbock, Tex., branch office to Midland, Tex. **John T. Cross Jr.** has been appointed branch manager at Hobbs, New Mexico.

Fred M. Carothers has been appointed district sales engineer, with headquarters in Meadville, Pa., for Highway Equipment Co., Pittsburgh.

L. E. Sweet has been named general superintendent of the dishwasher and

electric water heater plant of Hotpoint Inc., Milwaukee. **M. E. Maurer**, formerly acting superintendent at the Milwaukee plant, has returned to his post in Chicago as manager of manufacturing engineering for Hotpoint.

J. G. Elmore, associated with the Norge Division, Borg-Warner Corp., Chicago, has been promoted to plant manager of the company's Range Manufacturing Division at Effingham, Ill. **K. E. Anderson** has been named assistant plant manager at Effingham. The appointments follow the resignation of **C. E. Smith**, former plant manager.

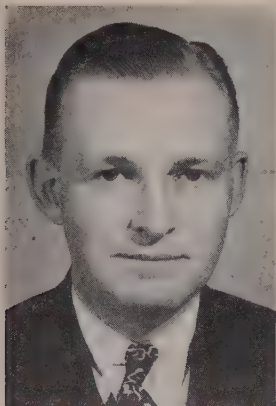
C. A. Franklin Jr. has been appointed district manager in the Rocky Mountain area for New York Belting & Packing Co., Passaic, N. J.

Emory Johnson and **Louis Siegel** have been appointed assistant sales managers for Levinson Steel Sales Co., Pittsburgh.

Richard H. DeMott, vice president in charge of sales, SKF Industries Inc., Philadelphia, has been elected president for 1949 of the Exhibitors Advisory Council. He succeeds **Samuel Y. Hyde**, director of commercial and educational exhibits of American Can Co., who becomes executive vice president. Other officers elected are **M. L. Neison**, United States Steel Corp., Pittsburgh, vice president; **David F. Beard**, Reynolds Metals Co., Louisville, secretary; and **P. L. Hunter**, International Business Machines Corp., New York, treasurer.

Atlantic Steel Co., Atlanta, announces the following officers recently elected: **Charles F. Stone**, chairman of the board; **Robert S. Lynch**, president; **Wilbur F. Glenn**, vice president; **Howard B. Johnson**, vice president-sales; **Joseph H. Girdler**, vice president-operations; **Gilbert Purvis**, treasurer; **C. Howard Candler Jr.**, secretary; **Robert S. Stradley**, assistant secretary and assistant treasurer; **Charles F. Williams**, general manager of sales; **R. E. O'Neill**, manager of the order department. **Marshall B. Hall** was elected to fill a vacancy on the board of directors.

Walter D. Teague, head of the New York firm of industrial designers which bears his name, has announced that three senior members of his staff have been made partners. **Robert J. Harper**, director of design, who joined the firm in 1935, was named a partner in 1945. The new partners and their duties are as follows: **Rob-**



IRVING A. DUFFY

Appointed director of purchasing, Ford Motor Co., Dearborn, Mich. Noted in STEEL, Feb. 7 issue, p. 87



JOHN R. BARTIZAL

Elected executive vice president, Clearing Machine Corp., Chicago. Noted in STEEL, Feb. 7 issue, p. 84

ert H. Ensign, director of product design; Eugene Gerbereux, business manager; and Frank Del Giudice, who is in charge of the Teague representatives at the Boeing Aircraft Co.'s plant in Seattle. John D. Brophy, who has been business manager since 1932, was named controller.

George M. Neal, division operations engineer, Wenonah, Ala., red ore mine, has been appointed assistant to the manager of industrial relations, Tennessee Coal Iron & Railroad Co., Birmingham.

Frank H. Higgins, vice president and

chief executive of the Detroit plant of Hupp Corp., has joined the staff of the Office of Special Representative, Paris, Economic Cooperation Administration.

William Eipel, Tuck & Eipel, New York, structural engineer, has been elected president of the New York Association of Consulting Engineers. He succeeds Darl Hunt of Krey & Hunt, consulting engineers.

James W. Murray has been elected president and director of Murray Steel Supply Corp., New York. Mr. Murray's company will have a ware-

house in the metropolitan area handling various steel products and industrial equipment. He had been associated with Jones & Laughlin Steel Corp. in New York since 1936.

William N. Brown has been appointed Chicago district purchasing agent of American Steel & Wire Co., Cleveland, United States Steel Corp. subsidiary. He succeeds I. E. Bowen, named assistant to the purchasing agent, and he will continue to maintain his headquarters in Chicago. Headquarters of the purchasing department are located in Cleveland.

Daniel Mapes, vice president in charge of engineering & development, and a director of Walter Kiddé & Co. Inc., New York, has been elected a vice president of the Compressed Gas Association, New York.

Thomas E. Berry has been appointed manager of domestic sales for low-temperature welding and brazing alloys and fluxes manufactured by All-State Welding Alloys Co. Inc., White Plains, N. Y. He has been Eastern Seaboard regional sales manager.

Ralph W. Massey has been named Pittsburgh district sales manager of Superior Steel Corp., Carnegie, Pa., succeeding Fred L. Fox, who has been named assistant general sales manager. Mr. Massey has been located in New York and New England sales offices.

OBITUARIES . . .

Joseph E. Michaels, 45, secretary-treasurer, Hyman-Michaels Co., Chicago, was killed Feb. 19 in an airplane crash near Coventry, England. Mr. Michaels had been with the internationally known railroad equipment and scrap firm since graduation from the University of Michigan in 1925. At the time of his death, he was manager of Hyman-Michaels' rail department.

Ertie L. Foreman, 55, manager of the Los Angeles office of Whitman & Barnes, division of United Drill & Tool Corp., Detroit, died Feb. 9.

Paul Fielden, 62, director of purchases of Norton Co., Worcester, Mass., and former president of the National Association of Credit Men, died Feb. 6. He was associated with Norton for almost 30 years.

Jeffrey M. Taylor, 70, retired secretary-treasurer, National Foundry Association, Chicago, died Feb. 15. Mr.

Taylor, an attorney, joined NFA in its Detroit office in 1900, later moving to its eastern offices in New York, and in 1912 was made secretary-treasurer with offices in Chicago.

Clarence J. Heil Sr., 52, purchasing agent for Heil Co., Milwaukee, died Feb. 17 after a short illness.

John M. Mackenzie, 75, a founder and retired manager and treasurer of Mackenzie-Walton Co., Pawtucket, R. I., died Feb. 18.

Alexander Thomson, 54, treasurer, Mantle Lamp Co. of America, Chicago, died recently in Clearwater, Fla., where he had been vacationing.

Charles Gutman, 66, founder and president, Premier Tool Works Inc., Chicago, died Feb. 18.

Arthur S. Nichols, 48, vice president, Illinois Clay Products Co., Chicago, died Feb. 18 in that city following an extended illness. He had been as-

sociated with the company 23 years. In 1946 he was chairman of the Chicago section, American Institute of Mining & Metallurgical Engineers.

Edward Bray, retired assistant manager at Seattle for Columbia Steel Co., died Feb. 17.

Harry F. Bower, vice president and general manager, Buckeye Forging Co., Cleveland, died Feb. 19 in Chicago, where he was attending the semiannual meeting of the Association of Drop Forge Men.

O. K. Marti, 58, consulting engineer for Allis-Chalmers Mfg. Co., Milwaukee, died Feb. 15 after a short illness.

George A. Ricker Sr., 57, general manager, Torchweld Equipment Division, National Cylinder Gas Co., Chicago, died recently of a heart attack.

John Roth, 69, president, Johnson Meier Co., Chicago, ornamental iron-working firm, died Feb. 12. He had been president for nearly 30 years.



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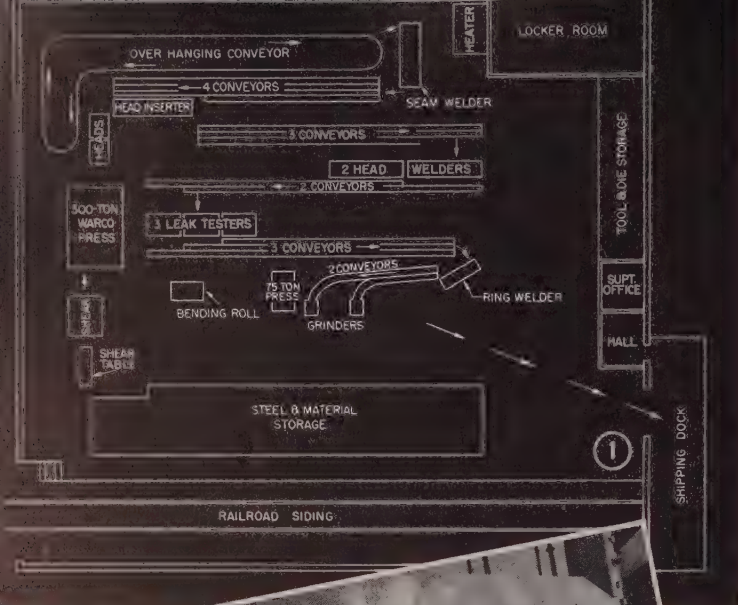
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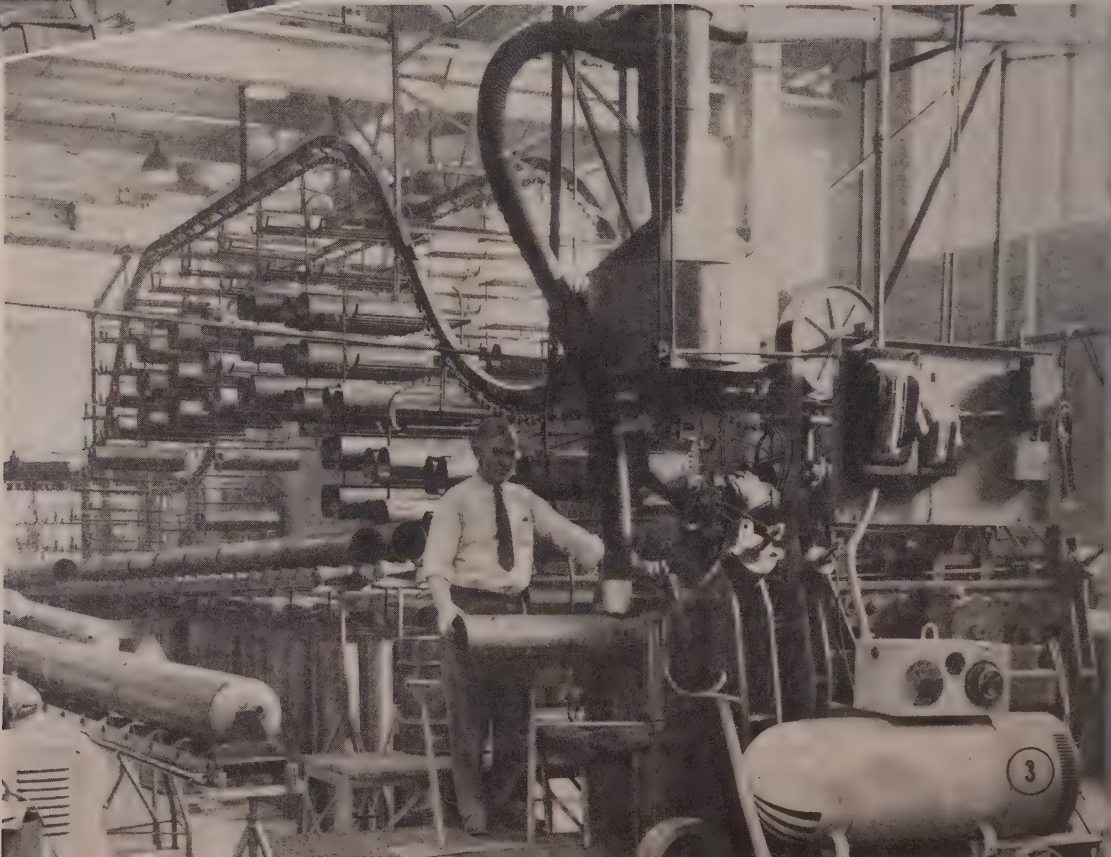
Forming

Some 10,000 water softening tanks for both domestic and industrial use are produced monthly in Culligan Zeolite's new plant. High handling efficiency is combined with latest methods of forming, welding, testing and galvanizing

By E. F. ROSS

Chicago Engineering Editor, STEEL

PHOTOGRAPHY BY DAN REEBEL



and Welding Operations

KEY FACTORS IN TANK FABRICATION

RESIDENTS of many sections of the United States handicapped by hard water supply are familiar with the Culligan soft water service available in their communities. The service involves the installation and connection to the home water supply of a tank unit approximately 9 inches in diameter and 45 inches high which requires no attention from anyone in the household. The unit is exchanged at regular intervals, a serviceman simply removing the used unit and replacing it with a fresh one. Beyond the domestic application are also numerous and large volume uses of soft water industrially.

Soft water service was introduced by Culligan Zeolite Co., Northbrook, Ill., a company formed about 10 years ago by Emmett J. Culligan, who, having come from South Dakota where water is hard, knew how much soap is used unnecessarily and sought a remedy for the situation. In 1936, Mr. Culligan began to

make zeolite, a hydrous aluminum-sodium silicate, by a method which greatly reduced its then high cost. Following this cost-reducing achievement, he initiated the replaceable tank service.

At the outset, Culligan Zeolite Co. purchased its tank requirements, but rapid expansion of the business prompted it to start making its own tanks in 1940. This program was necessarily interrupted during the war but fabrication was resumed on a bigger scale in 1945. These facilities were soon outgrown as demand for soft water service continued to increase and within the past year the company has completed a new modern tank fabricating plant near its main offices and original plant in Northbrook. Capacity of the new plant is 10,000 welded steel tanks a month on a one-shift basis, and double that if two shifts are employed.

New tank fabricating plant is of one-story, brick

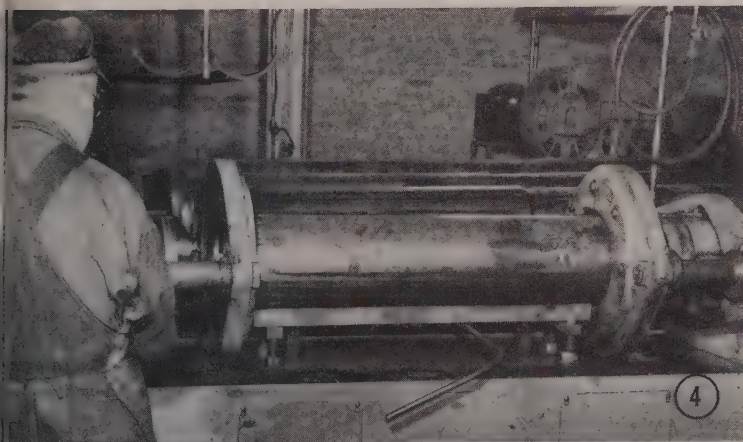


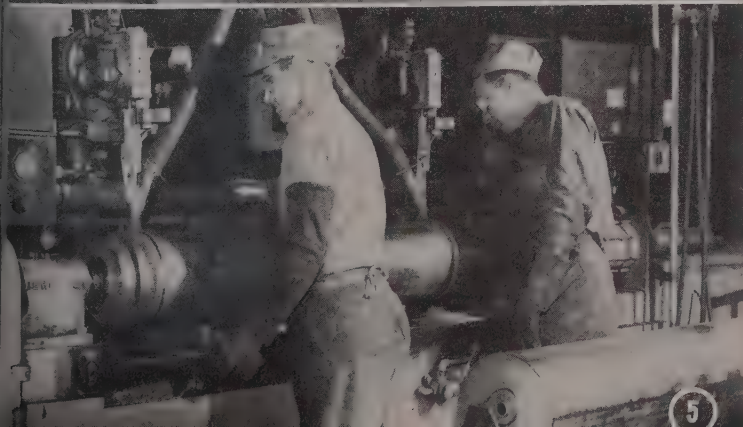
Fig. 1—Efficient plant layout combined with good materials handling facilitates fabrication of welded steel tanks

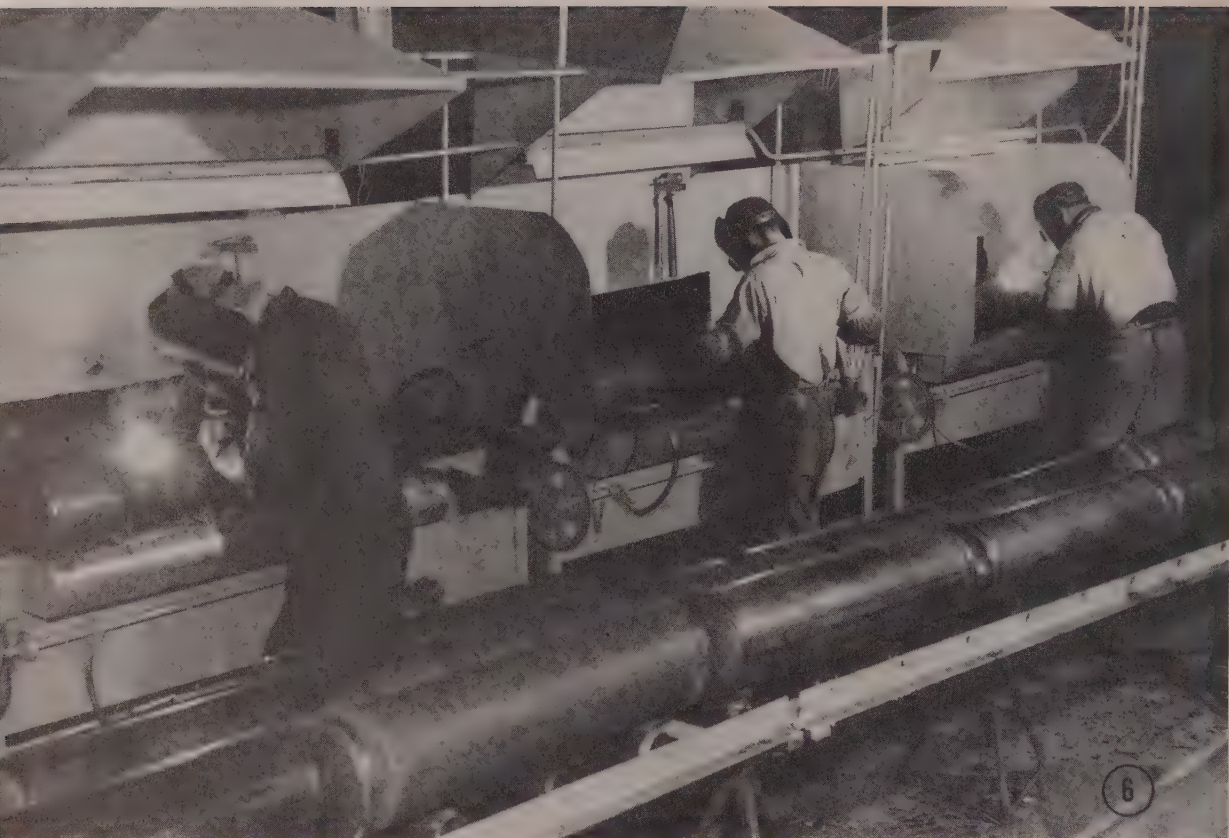
Fig. 2—Tank shells are formed in this 300-ton press equipped with a three-stage progressive die

Fig. 3—From the forming press, tank shells are moved to the seam welder on an overhead chain conveyor, which, with accommodation for 460 shells, serves as mobile storage

Fig. 4—Tank head and bottom are inserted in the welded shell simultaneously in this hydraulic machine

Fig. 5—Head and bottom are welded into the shell by submerged arc in a girth seam welder. The two welds are made simultaneously and at a speed of 60 inches per minute





and steel construction and provides 11,200 square feet of floor area. Layout and adequate handling equipment facilitate efficient flow from raw materials to finished tanks. Inside the plant along the north side is a railroad track accommodating two freight cars and depressed to afford door level unloading of incoming material. Adjacent to the railroad siding is an ample steel and material storage area. Two parallel craneways with interconnection are equipped with two 3-ton Conco electric lift hoists which serve the storage area and the presses. General layout of the tank fabricating plant is shown in Fig. 1.

Tanks fabricated from steel and subsequently hot-dip galvanized to provide corrosion resistance stand up well in water softening service. The shells are made from 14-gage hot-rolled pickled sheets purchased in 30 x 120-inch size and blanked in a Cincinnati shear to 28 5/16 x 39 inches. Blanks are piled on skids placed to the right of a 300-ton Warco crank press and hand fed by one of two operators into the press.

Forming Tank Shell—Forming of the tank shell is accomplished in a three-stage progressive die, Fig. 2, with sequence from right to left. First operation consists in forming or bending the two sides of the shell blank to fit the lower part of the second die. Second operation forms the shell to approximate V-shape to fit the third die, and third operation forms the shell to a perfect cylinder 9 inches in diameter.

Formed shells are removed from the die by the operator serving the left side of the press and are placed in a horizontal position in rack hangers sus-

pended from an overhead chain conveyor, Fig. 3. Each rack hanger has capacity for ten shells and with all of the 46 racks fully loaded the conveyor has a maximum capacity of 460 shells. Since the conveyor is of the endless loop-type, it provides temporary storage of shells between the press and subsequent fabricating operations. Conveyor operates clockwise and in its central section goes overhead, descending as it approaches the seam welder.

An operator removes the shells from the conveyor

Fig. 6—Following welding, tanks are tested for leaks, put under air pressure and submerged in one of three identical units

Fig. 7—In this machine a formed ring is arc welded to the tank bottom to serve as a base. Tanks move to the machine on roller conveyors and after welding proceed in the same manner to the weld grinding operation

Fig. 8 — Rings which serve as tank bases are punched and formed on a 75-ton crank press. Die sets are changed to accommodate the full range of forming operations

Fig. 9—This machine, equipped with two electric stud welding guns mounted in a hinged fixture, welds two small hollow studs to tank top for attachment of the nameplate.

Fig. 10—In this specially-built machine, two 3/4-inch holes in the tank top and one of same size in the bottom are tapped simultaneously

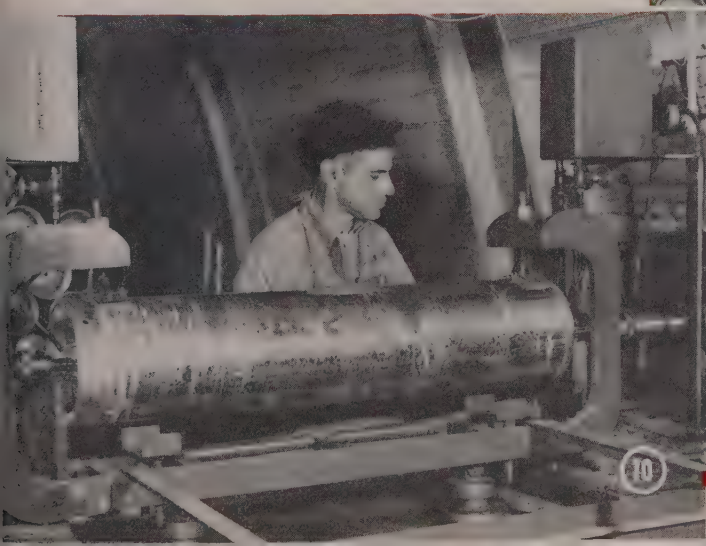
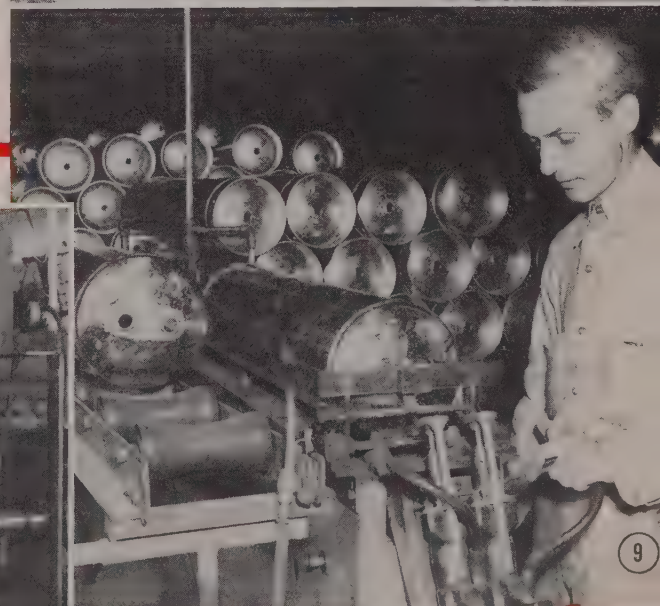
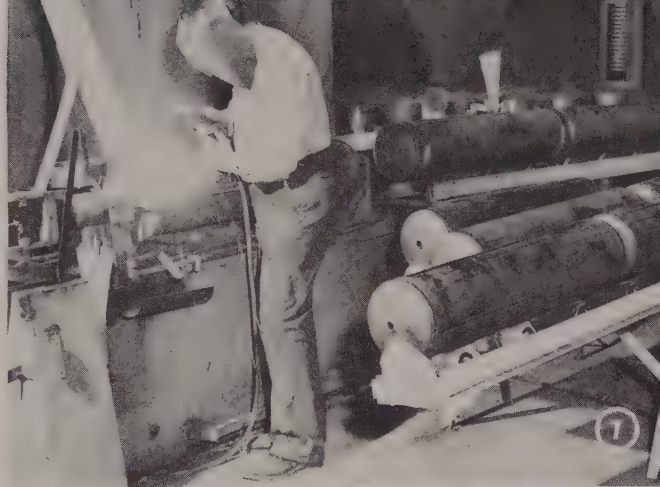
and inserts them in an automatic submerged arc welding machine, Fig. 3. This unit supports the shells on rollers and welds at a rate of 60 inches per minute. The machine has a Linde Union-Melt automatic welding head using $\frac{1}{8}$ -inch diameter welding wire from a coil, and current is supplied by a Lincoln portable generator. Flux is recovered by a standard vacuum system and is reused.

A second operator, serving the discharge end of the machine, removes welded shells and deposits them on one of the four parallel portable-type gravity conveyors, Fig. 3, for transfer to the head inserter. Four conveyors are utilized for this transfer to provide adequate in-process storage. An operator uses a special tool to pull a tank shell from the conveyor into the head inserter, Fig. 4, which is a specially-built hydraulic machine.

Tank heads and bottoms are purchased items made from 9-gage deep drawn-steel, with two $\frac{3}{4}$ -inch holes or spuds extruded in the heads and one hole of the same size extruded in the bottoms. As received in the plant, heads and bottoms are stored in tote boxes, and as needed are transferred and dumped by a Clark gasoline lift truck into conveniently reached storage bins adjacent to the head inserter.

Head and bottom are inserted into each shell simultaneously, as shown in Fig. 4, after which the operator removes the assembled tank from the machine and deposits it on one of three gravity roller conveyors at his right rear to move on to two head welders. The latter, Fig. 5, are duplicate Berkeley girth welders employing Unionmelt submerged arc. Current is supplied by Hobart portable generators. A tank is lifted from the roller conveyor, inserted in the machine, and head and bottom are welded in at a rate of 60 inches per minute. Welding completed, a small lifting table elevates the tank and rolls it through the back of the machine onto a gravity roller conveyor for transfer to the leak test.

Leak Testing—Because leak testing and weld patching are performed at the same time, three testing units are provided to (Please turn to Page 94)



By JOHN T. SLOAN
Foreman, Renewal Parts Dept.
Reliance Electric & Engineering Co.
Cleveland

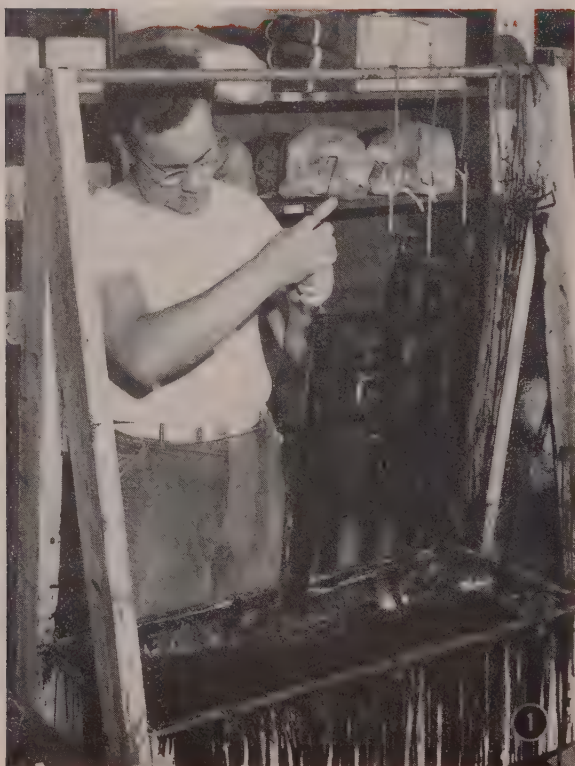
OFF

THE

SHELF



SERVICE *Speeds Replacement Parts*



By stocking renewal parts packaged for shipment, one electric motor manufacturer is reaping benefits in the form of increased efficiency and customer good will

A TIME-SAVING, manpower-conserving, "off-the-shelf" service, based on progressive packaging of replacement parts is the result of Reliance Electric Co.'s decision to enlarge and modernize its renewal parts department. Departmental operation and procedures of the Cleveland concern are now geared to facilitate the dispatch of replacement parts from producer to user in the shortest possible time.

Renewal parts orders account for approximately 8 per cent of the company's annual sales volume, reflecting a steady increase over the past few years. To meet the heavier departmental work load anticipated and to expedite further material flow in parts packaging, floor area renewal parts department was expanded from 3000 to 4500 square feet. Storage bins were rearranged for greater centralization and more convenient accessibility; a 70-foot roller conveyor was installed, running from paint spray booth to packing tables; two 18-foot craneways, each equipped with a 1-ton electric hoist, now service the general packaging and export packing areas.

With off-the-shelf deliveries made entirely feasible



Fig. 1 Motor shafts and other parts with exposed machined surfaces are dip-coated with quick-drying, non-oxidizing rust-preventive solution

Fig. 2 General view of renewal parts department. Packing operations are carried out on tables adjoining conveyor. Two 18-foot craneways, each equipped with a 1-ton electric hoist, are used for moving heavy motor parts packed for shipment in crates

Fig. 3—Roller conveyor running from paint spray booth 70 feet to packing tables expedites materials handling. Brackets at end of conveyor are packed in corrugated fiberboard cartons, heavier parts in wooden boxes

Shipments

by the establishment of a complete supply stock, built up in advance and maintained continuously with "packaged" parts, emergency shipments can be made on standard items at virtually a moment's notice. Equipment breakdowns are speedily repaired and costly production losses held to a minimum.

Other notable advantages accruing to the motor user from this newest "wrinkle" in maintenance parts merchandising include quicker inspection and easier stocking of parts in his own maintenance department; positive protection of parts against dust and dirt; and simplification of purchasing, with consequent time and money economies, when reordering replacements.

To Reliance, off-the-shelf shipment of packaged renewal parts also spells a number of important benefits. Orders are handled, filled and packed for shipment without delays or lost motion, expediting initial handling and final delivery. Modern packaging materials, combined with systematic packing routines, promote maximum economy of operation.

Orders for renewal parts received from district sales offices or customers are first entered in a purchasing order book showing customer's name and purchase order number and sales order number. Orders are checked against a serial number book for specification of parts by correct part number. After these mechanical specifications are verified,

correct part numbers inserted and material locations listed, the order is typed.

It is then checked against a departmental stock ledger, from which material is deducted, and the best promise of delivery sent to the customer. Unless the part is a specialized item, immediate shipment can be made from stock. Duplication of the order form follows, with one copy remaining in the office for billing and recordkeeping purposes and the other going to the stockroom supervisor, who distributes the orders among the packers for filling. Other copies of the order, including customer acknowledgment copy, invoices and district office notification, are also made and distributed.

Ranging in size from carbon brushes and tension springs to armatures and field coils, parts for alternating and direct current motors of from 1 to 500 horsepower and the company's other principal products are stocked in 21 bays, each 18 feet long, 30 inches deep, and 8 feet high. Altogether, items stocked total between 1500 and 1600 according to part number. Orderly, convenient arrangement of these bins enables individual parts to be selected quickly and easily by the stock clerks.

In packaging its renewal parts for stocking and shipping, the company relies on containers of five general types: 1. Transparent cellophane bags; 2. folding boxes; 3. corrugated fiberboard cartons; 4.

cloth mailing bags, and 5. wooden crates. Each is used to package parts of certain general size ranges.

Small-size items are packaged in a transparent cellophane bag of duplex construction. These consist chiefly of clamps, brush holders, special stainless steel nuts and bolts, as well as heaters, connectors, coils, contactors and related components for control panels.

Moisture-proof, with heat-sealed bottom and anchored coating, this type package first found wide usage throughout the war period for packaging aircraft rivets and small lathe parts, among others, because it so effectively facilitated handling small structural components by assembly-line operators. Sealed with laminated tape, this type of bag also has an easy marking panel for parts identification that takes ink readily. Four different sizes are used, ranging from the smallest measuring 3 x 5 inches to the largest measuring 6 x 9 inches.

Advantages obtained with the use of this transparent plastic packaging are many. It enables the customer to inspect the contents without opening the package which, being tape-sealed, helps to protect machined surfaces against rusting or accumulating dirt in storage. Packaged parts thus simplify stocking problems for the motor user while protecting the product.

Other parts, small yet too large for packaging in cellophane bags, are packed in self-mailing type folding boxes. A dozen different sizes are used, ranging from the largest of 0.036-inch thickness and measuring 7 5/16-inch long, 1 1/2-inch wide and 7 5/16-inch high, to the smallest, which is 0.024-inch thick and measures 1 1/2 x 1 3/8 x 2 inches. Eight sizes have reverse tuck with locking slits; four are lockless with double flap for packing heavier parts.

Of heavy double-wall construction, the corrugated fiberboard container used to pack still larger parts meets both Mullen and Cady tests for bursting strength of 200 pounds per square inch. When the carton is used as the shipping container, the Interstate Commerce Commission gross weight limit of 65 pounds applies; but when the carton is overpacked in steel boxes or wooden crates, this limit may be exceeded. Cartons of eight different sizes,

ranging from 5 x 5 x 5-inches to 17 x 8 x 8-inches, are used.

Corrugated fiberboard containers, as with the folding boxes described, prove highly advantageous, promoting savings in handling and shipping, lower first cost, greater availability and added customer convenience. Each container is a completely packaged unit, so that it can be stocked and shipped without further handling.

While all corrugated boxes carrying goods shipped via rail are guaranteed by the boxmaker to meet rigid requirements set up by the I.C.C., careful judgment still must be exercised in general practice when it comes to selecting the right type of board and construction for the particular product to be shipped. Each product presents its own special problems as to cushioning, bracing, protection and ease of loading and unloading. Sometimes the cheapest package proves the most costly in the long run, especially if the design is such as to involve excessive man-hours in loading. Reliance uses double-wall corrugated cartons for shipping many replacement units because of the extra strength and added cushioning effect provided by such containers.

Cellophane bags, folding boxes and corrugated fiberboard containers thus may be said to combine to form the cornerstone of Reliance's off-the-shelf delivery service on renewal parts. Stocked in bins, these packages make order filling a simple matter. Specified items can be picked off the shelf in a jiffy in much the same manner that a housewife shops in a self-service supermarket. This is a tremendous time-saver when it comes to "delivering the goods" in a hurry to meet customer emergencies.

As manufactured parts are received, they are packed and stocked. While some operators replenish shelf stock up to required minimum levels, others are kept busy packing parts for current orders. When rush orders arrive, it is no problem to fill them. Such orders get priority treatment. Parts are simply taken off the shelf, a label pasted on the package, and they are ready for inspection, weighing and shipment via truck, train or plane.

A case history, typifying hundreds of similar situations handled by the (*Please turn to Page 100*)



Fig. 4 — Orderly arrangement of stock bins facilitates selection of parts for filling orders quickly. Operator in foreground is bottom-stitching corrugated carton preparatory to packing and shipping, while another operator packs small parts in transparent cellophane bags

ARTISANS VS. MAGICIANS: In the course of researches which I now am making on conservation of metals, I have come across a wonderful example of how value can be multiplied through exercise of skill and ingenuity.

In these days when so many people are looking for "something for nothing", it may be in order to contemplate how the Swiss in the mountain district of Neuchatel improved their condition tremendously by deliberately undertaking to make themselves a community of watchmakers.

Writing in January, 1836, one of this group—a man by the appropriate name of Houriet—tells how his community sent emissaries to France to pick up rudiments of the craft. One of the most intelligent of them was a blacksmith. After "getting a line" on the French methods, these "horologers" as they called themselves, returned to Neuchatel. There they established shops with the help of their fellow citizens and designed machines to replace French hand operations.

In a short time they not only were manufacturing quantities of excellent watches which achieved world-wide sale, but also—adds M. Houriet—"The manufacture of watchmaking tools and appurtenances has become a branch of our industry of such importance as to enable us to supply them to those countries from whence we formerly imported them." There undoubtedly is the story of the beginning of Switzerland's manufacture of precision machine tools, which today is a very substantial industry in its own right.

About all that these Swiss horologers had to start with were mountain air, waterpower, ingenuity, ambition and community spirit. Aside from wood used in making cuckoo clocks, practically all raw materials had to be imported.

Ancient alchemists tried to get something for nothing by converting base metals into gold. They failed. The Swiss horologers succeeded where the alchemists failed. They were "enterprisers"—not magicians. By converting the "base metal" steel into hairsprings for watches, they made it worth more than its weight in gold.

PERSISTING APPEARANCE: Designers of industrial products find it extremely difficult to break very far with the accepted appearance set by previous models. Those in the consumer goods industries blame that on the unwillingness of customers to purchase something radically different in looks from the models currently being driven or worn or otherwise used in everyday life.

In the case of designers of industrial machinery, however, the difficulty seems to lie more with the designers themselves. They are more bound by tradition than their customers are. For many long years, saw mills were merely mechanized "pit saws" and power hammers were merely mechanized blacksmiths' hammers. Are you sure that some of your machines are not like that also?

Only the other day I was shown a case where designers had for decades struggled with chip troubles and cam troubles in an automatic lathe. Finally it occurred to an innovator that if the mechanism simply were turned upside down, those problems would be solved. The designers resisted this idea on the

SEEN AND HEARD IN THE

Machinery Field

By GUY HUBBARD
Machine Tool Editor

ground that since the days of Henry Maudslay, lathes had been built "right side up—not upside down". The innovator had quite a time proving to them that what was right side up to Henry Maudslay had come to be upside down in our era of automatics.

PROJECTION MACHINING: Among the most persistent relics of the past which are mixed in with modern machine shop practice, are various techniques which come under the head of "cut-and-try" methods. While they have been pretty well eliminated from the assembly floors (once called "fitting shops") in the mass production metalworking industries, they do hang on in the machining divisions.

One example is the traditional way of machining in which a cut is taken, then a measurement taken, then another cut taken, and then another measurement taken—this last supposedly being "right on the nose". That obvious form of "cut-and-try" seems to be hard to get rid of—which may be due in part to the breathing spell which it gives to production workers.

Tool room operations are by their very nature full of cut-and-try. Therefore it is peculiar circumstance that in a place where there is some excuse for them, determined efforts are being made to eliminate them. One of these is through coupling up of projection measuring apparatus with precision grinding machines.

The old method was to do the work first and project it afterward. That corresponded to locking up the barn after the horse was stolen. The new method is to project the actual machining operation so that the operator can watch his work directly on the screen and machine it right to the line. This amounts to direct translation of the mechanical drawing into the precision metal product without intervening gaging in the old sense of that word.

So far this kind of thing largely has been confined to tool room work such as form tool grinding and to single projection steps under 1 inch. However, many manufacturing techniques have been born in the tool room and have grown up in the production shop.

Projection machining shows distinct signs of following the same course, as it gets a foothold on machining of parts used in gas turbines and similar highly specialized jobs where accuracy and quantity go hand-in-hand. When a camel gets his nose into a tent, the entire camel soon is in the tent. That is about the way it goes when a "tool room method" edges into the manufacturing plant.

Technical drawing of a mechanical part, likely a valve or plug, showing dimensions and tolerances. The drawing includes a top view and a side view. Key dimensions include diameters of 1.25, 1.26, and 1.27, and a length of 1.25. Tolerances are specified as ± 0.002 and ± 0.001 . A note indicates "HARDEN V 32 SURFACES MARKED". A circular feature is labeled "1.26 DIA".

that the work is clear of the broach. As five of six fixtures are always idle and can be loaded and unloaded without undue hurry in this interval, the actual loading time is not of first importance because it is done while previously loaded parts approach, pass through and return from the broaching position.

Actually, loading is done chiefly or entirely in the front position or 180 degrees away from the broach. This, of course, makes loading safe. Rapidity in loading and unloading is promoted by having jaws well adapted to hold and locate the piece and by providing quick-acting toggle clamps. Although these could be operated mechanically, hand operation is easy and, as an operator is required anyway, there is no point in providing mechanical actuation.

For some parts, at least, magazine feed for automatic loading could be combined with mechanical clamping, unclamping and ejection, if the quantity of duplicate pieces required warranted the added expense. As it is, quantities are not large and setups have to be changed frequently, hence complete mechanization has not been attempted. Clamps are so made, however, that jaws designed to accommodate a particular part can be changed quickly.

Base of the fixture is a heavy casting having an extending arm for support of an air cylinder. A spindle, fixed to the base, serves as a journal for the rotating parts that include the table to which the clamp holders and work supports are attached.

Under the table, and fastened to it, are an indexing plate and a ratchet wheel, the latter resting on a spur gear which is engaged with a rack, attached by nuts to a bracket mounted on the frame of the broaching machine. On the top face of the gear is a pin on which is pivoted a pawl that turns the ratchet wheel and parts attached to it clockwise when the reciprocating table on which the fixture is mount-

NEED for faster broaching certain surfaces of small parts has led tool engineers of International Business Machine Corp.'s Endicott, N. Y., plant to design a unique indexing fixture. Shown in Fig. 3, the fixture at least doubles the output of parts from the machine to which it is applied, a 3-ton, 48-inch stroke broaching machine equipped with a vertical ram and a table that is reciprocated horizontally between broaching strokes.

Much of the broaching is done on stampings, the broach being employed, as a rule, to provide surfaces that are smoother and can be held within closer dimensional limits than are attainable on edges produced by blanking or shaving dies. It is therefore essential that the piece to be broached be held securely and, if it is to be indexed into successive broaching positions, that the indexing be precisely done.

As the machine used can operate at a speed higher than it is feasible to bring the work, properly clamped, into broaching position, a prime consideration was to devise a fixture that would position the work faster than the previously-used conventional fixtures were able to do. In other words, output could be upped by decreasing the total time for loading and shifting.

This result was achieved by providing a dial having six duplicate holding stations and by providing means by which the dial is turned quickly and locked in precisely indexed position during the brief period

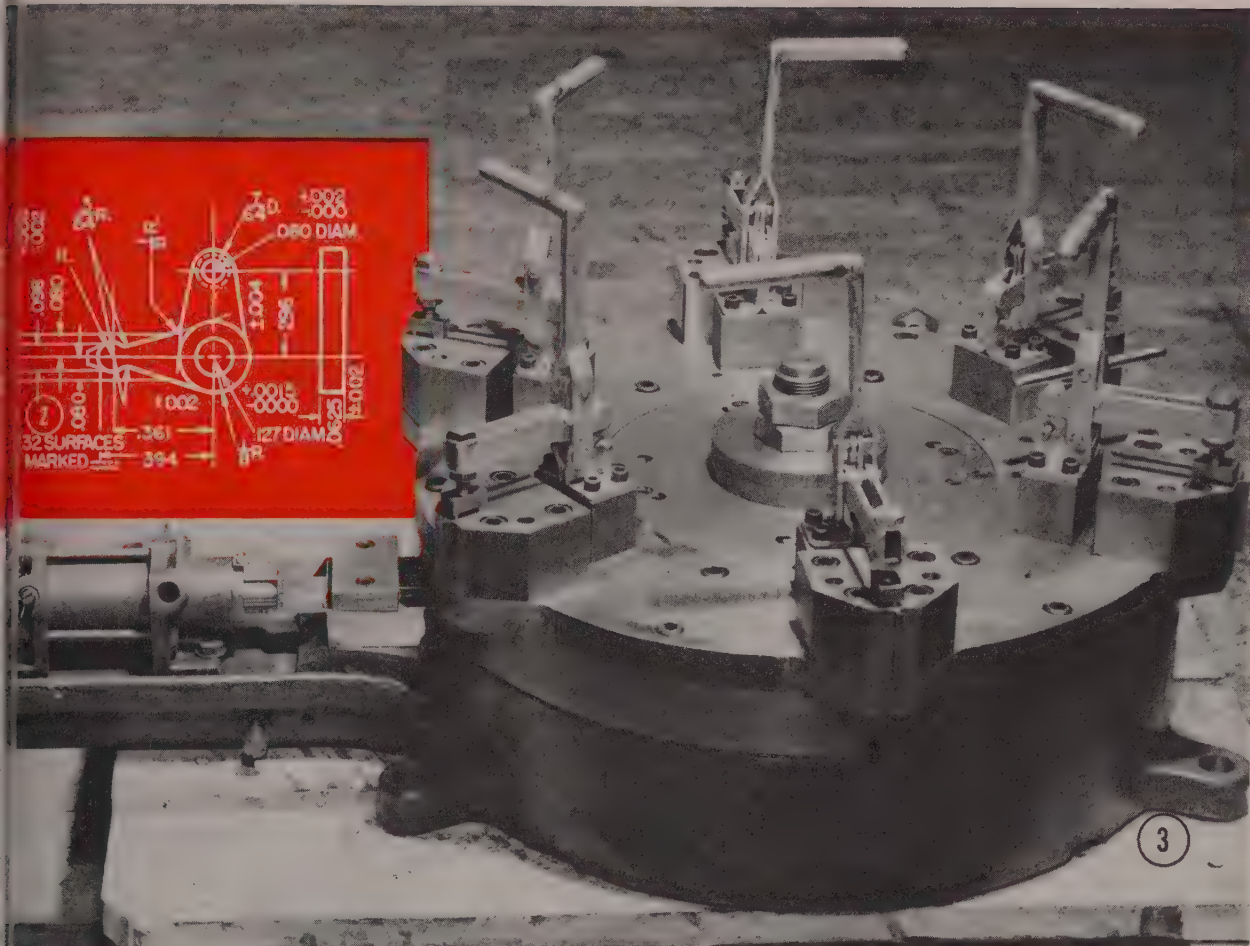


Fig. 1—Stamped piece whose rounded end has two broached radii. Piece is broached one at a time

Fig. 3—General view of dial fixture with six holding stations that are used in succession. At left is an air cylinder whose plunger operates a key that locks the rotary table while broaching is in progress.

ed is moved outward. On the return stroke, the gear turns counterclockwise but the pawl disengages ratchet tooth, hence ratchet wheel is not turned.

To insure perfect indexing, the indexing plate is provided with six notches, open for each work holder. A pin, operated by an air plunger, has a rounded end that engages each notch in succession when the plate has to be locked, that is, while broaching is in progress. Air is supplied to both sides of the plunger piston; position of the plunger and key depends upon the valve assembly. Bleeder valves in this assembly are operated by a bar attached to the ram of the broaching machine. This bar is so set that, when the ram is down, air is bled from the right end of the cylinder and the key is withdrawn. As soon as the bar disengages the valve button, air bleeds from the left end of the cylinder and the key is forced inward and locks in the indexing plate slot.

When the indexing plate is thus locked, the fixture as a whole is locked and the broach makes its cut, but as soon as the broach clears the work and the bar pushes the valve button, the key is withdrawn and the machine table draws the fixture backward. This causes the fixture to index because the fixed

On the part shown in Fig. 1, similar broaching is done but parts can be handled only one at a time because the piece is formed upward at a 90-degree angle at one end. Location is over a single pin in a slot in which the piece makes a close fit.



How To Avoid

Watermarks on Aluminum

Good storage practice, as outlined here, can answer the problem of stains left by chemical-loaded water

*Recommended
method of storing
aluminum prod-
ucts*

By G. W. BIRDSALL
Reynolds Metals Co.
Louisville

IN the distribution cycle of practically every product, proper warehousing and storage methods are essential to retain greatest sales value. Aluminum, like every other product, should be handled and stored with due consideration for conditions that can reduce its sales value.

Good storage actually begins with a careful inspection of the material the moment it is received. Such an inspection will not only disclose any damage which may have occurred in transit but also will bring to light any conditions which might be a source of potential damage if allowed to remain uncorrected.

Aluminum in the soft tempers may be mechanically marked by rough handling, so should always be handled by means of grabs or other equipment designed to avoid high load concentrations that might dent or bend the material. Denting and bending of course do not affect mechanical properties of the materials; they simply necessitate a straightening operation.

First requirement of any building to be used for storing aluminum is that it be dry. Special equipment for keeping the building dry is not necessary. For practical purposes,

buildings sufficiently dry for storing other metals are suitable for storing aluminum, because aluminum is actually less subject to attack than are most other metals. Dry aluminum cannot watermark.

Aluminum is not damaged in any way by water under ordinary conditions of use. It is only when water is allowed to stand against aluminum for a prolonged period of time that watermarking occurs. Even then, pure water would produce no effect. Unfortunately, however, all water picks up certain chemicals from the atmosphere, some of which are almost sure to mark the bright surface of the aluminum if held in contact with the aluminum for an extended period of time. This occurs when aluminum sheets are allowed to become wet while in stacks.

Normal outdoor exposure of aluminum such as on a roof or side of a building is harmless because the water will dry off before it has a chance to produce stains. Staining results from the uncontrolled and nonuniform action that comes from allowing water to become trapped in stored aluminum products.

When the metal is to be painted, or for other uses where the original

surface is subsequently covered or treated, watermarking is of no consequence. Precautions need be taken to prevent watermarking only when the original bright surface is to be retained in the final product.

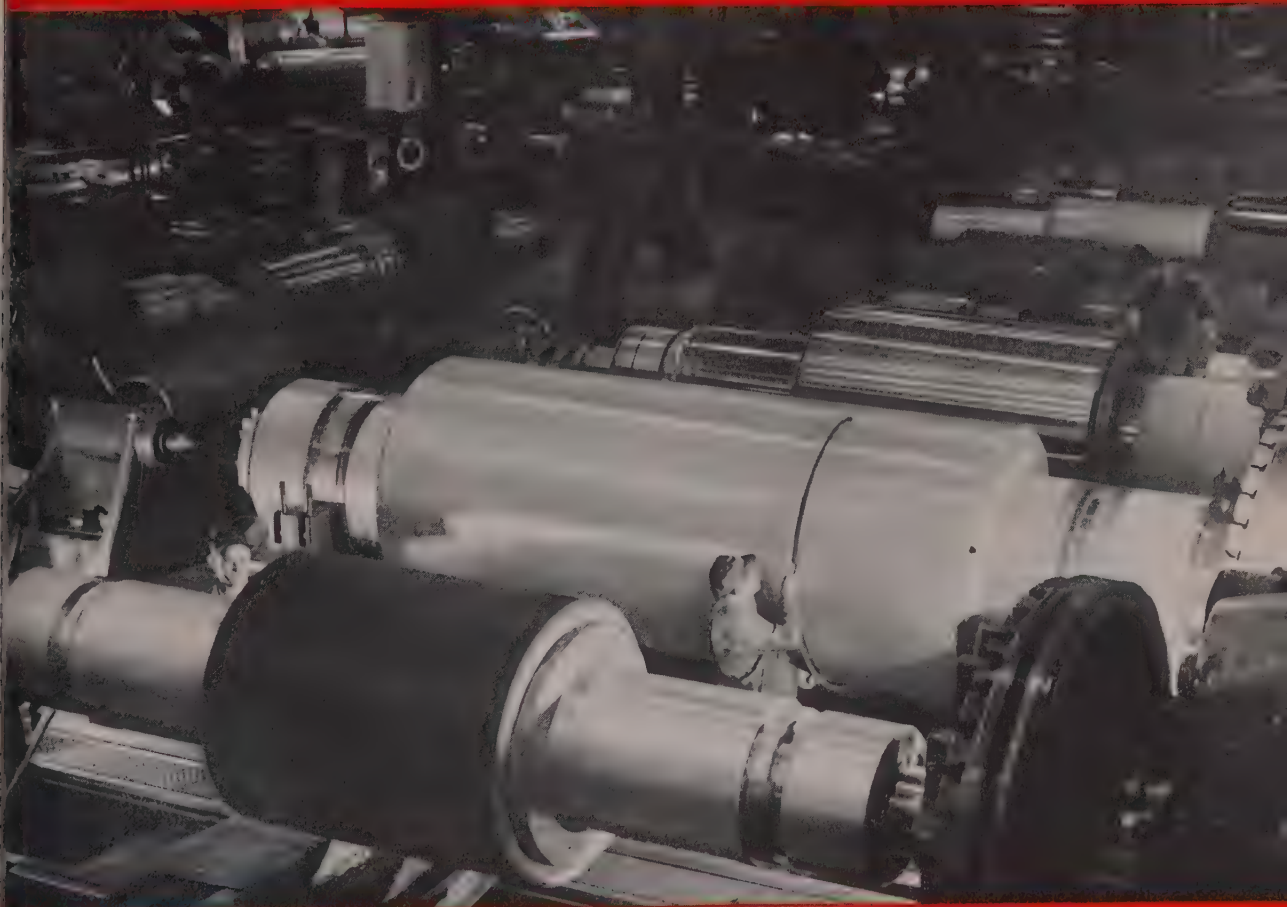
Oxide Coating—All aluminum possesses a natural coating of aluminum oxide which can vary greatly in thickness and character. Normally it is extremely thin, colorless and almost perfectly transparent. This oxide coating is exceptionally useful since it provides excellent protection to the aluminum surface. It is this coating which gives to aluminum its great natural resistance to corrosion and chemical attack because the oxide is inert and highly resistant to many chemicals.

However, this oxide coating is porous and can be marked by the action of chemicals in water allowed to stand against the metal for appreciable periods of time. The reaction with the aluminum and its alloying elements forms gray or white salts. These are inorganic metallic salts. They are always a mixture of various carbonates, sulphates, and the like. Their exact composition can seldom be determined. Such marks are purely superficial. They in no way affect the mechanical properties of the material.

Industrial atmospheres contain comparatively large amounts of chemicals which will increase the tendency to watermark. Other materials such as galvanized iron and steel will also develop similar markings under these conditions.

Alloy content greatly influences susceptibility of aluminum to attack. The purer alloys (2S, 3S, etc.) are most resistant, whereas those alloys with high copper or magnesium content are most susceptible to watermarking. High magnesium content

MESTA ROLLS

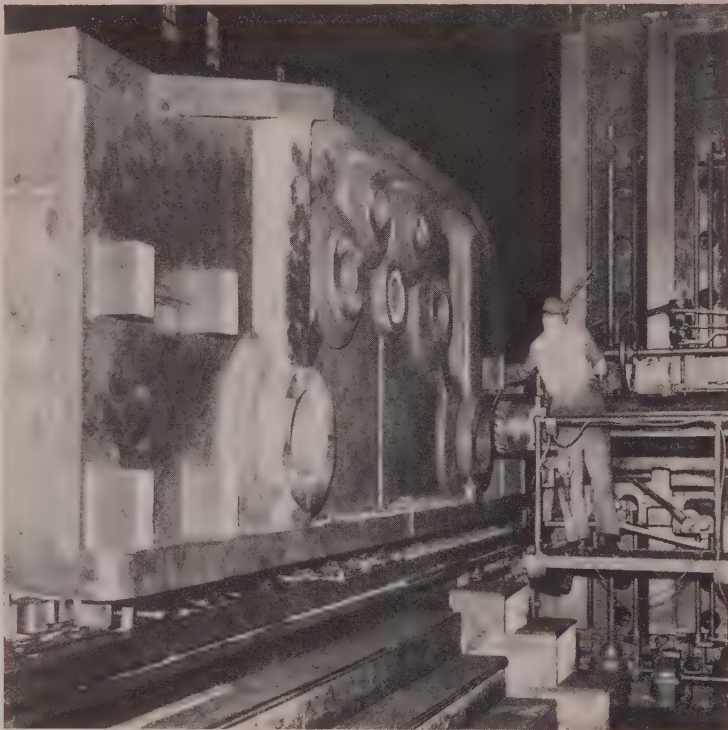


A section in one of the Mesta Roll Shops

Mesta produces all sizes of iron and steel rolls including the largest used in industry today. Efficient plant equipment, skilled workmen with long service records, an engineering staff whose technical ability has been accumulated over many years—these resources are responsible for Mesta's leadership in the production of the finest in rolls and other rolling mill equipment.

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

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MILLING A GIANT: This 48-ton press crown section is shown undergoing one of a series of milling and facing operations in one set-up of a large mill at the Salem, O., plant of E. W. Bliss Co. Intended to provide additional capacity for the manufacture of rails for the automotive industry, the press is to be installed in the Detroit plant of Midland Steel Products Co. It will deliver 2000 tons pressure at bottom stroke and is 220 inches between the uprights

of 52S makes it particularly susceptible due to the formation of magnesium salts.

Preventing Watermarks — It is a simple matter to avoid watermarking. See that the metal is dry when put in storage. Then secondly, store the metal in a dry place where water cannot drip or condense on it. Thirdly, stack the material in such a manner that it can easily dry out if it does become wet.

Shipments in open gondola cars or trucks may be received wet. Other shipments may become soaked in transit under leaky roofs or during unloading operations. In such cases it is important to separate the pieces and allow them to dry thoroughly before placing them in storage.

Since there is always some moisture in the ground, storing aluminum products directly on the ground should be avoided. Bundles or packages should always be separated by spacer strips or bars which should also be used to hold the metal up off the floor. This is important as it permits circulation of air through-

out all the area around the aluminum and aids in eliminating any moisture which may accumulate.

Where buildings are of the metal shell type, special precautions should be taken in heating to see that condensation does not form on the underside of the roof and drip on the metal stored. A suitable waterproof covering over the stored aluminum will prevent damage where such condensation cannot be avoided. A small amount of precaution here may prevent considerable undesired marking.

Removing Watermarks — Most any of the commercial etching compounds for aluminum will satisfactorily obscure watermarks at the expense of a superficial attack over the entire surface. A slight etch in a warm caustic solution will also remove the markings . . . or they can be removed by mechanically abrading the surface. A power-driven rotary brush is recommended. Certain polishing compounds can also be used satisfactorily.

While many methods of stacking aluminum products have been tried,

it is the general opinion among warehousemen that they should be stored on edge. This method of storing helps provide a ready means of draining away any moisture which may tend to condense as well as to drain off any water that may fall on the pieces. Storing packages on edge usually permits more effective use of floor space.

It is well to avoid storing aluminum for extended periods of time in locations subject to great changes in temperature or humidity, to prevent possibility of condensation. Unless suitable means for drying is provided, aluminum products should be protected from salt air or sea breezes in coastal areas while in storage, particularly the copper-bearing types. If stored aluminum does become wet, watermarking may be prevented by immediate drying. The sheets should be separated and dried individually.

Identification—With the many different alloys and tempers of aluminum all looking alike, it is important to provide proper identification. Naturally, storage in neat rows so that all items may be easily identified is highly essential. Identification should include number of pieces, alloy, temper, size, thickness and other pertinent data. It should be in such a position that it can be seen readily.

While storage near other metals does not harm aluminum, always avoid storage near such chemicals as alkalis, caustics, nitrates, phosphates, fertilizers, and certain acids.

Line of Hardfacing Alloys Announced

Developed to combat abrasion, impact, and heat and corrosion is a new line of hardfacing alloys divided into ferrous alloys, cobalt base alloys and tungsten carbide primary groups, announced by Air Reduction Sales Co., New York. The alloys are said to increase the work-life of equipment from two to twenty-five times.

To introduce the hardfacing alloy, the company is making a special offer of a trial assortment of alloys. Included in the assortment are the new Aircolite hardfacing alloy for equipment subjected to severe abrasion and medium impact, such as pulverizer hammers and core crusher rolls (for oxyacetylene and electric arc application) and the self-hardening alloy for equipment subjected to severe impact and abrasion such as bucket teeth and sizing screens (electric arc). Also included are instruction sheets for each of the two alloys plus a descriptive booklet covering the entire hardfacing line.

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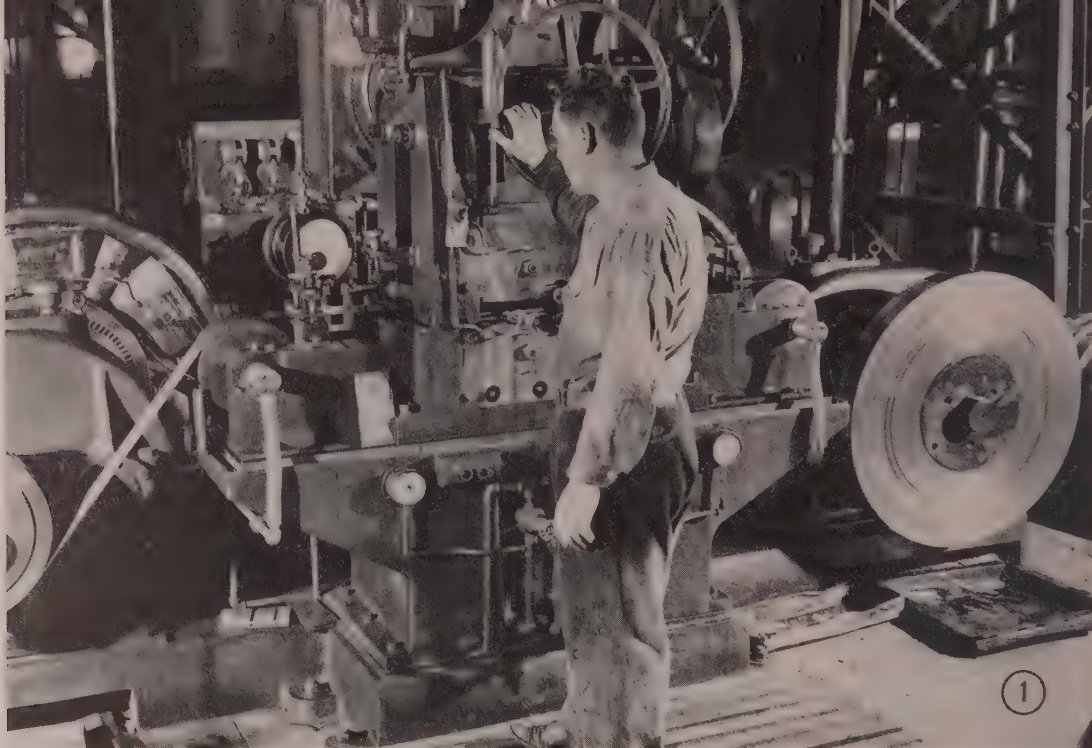


Fig. 1—This Bennewitz high-speed reversing cold rolling mill reduces spring, razor blade and other specialty steels to any desired thickness—down to 0.004-inch. Strands of steel are pulled between rolls at speeds up to 1200 fpm

Crucible Completes \$3,200,000 Plant Improvement Program

Cold rolling and special products divisions of the enlarged and newly-designated Spaulding Works are now in production on a wide range of alloy, stainless and high carbon steel specialties



THREE million two-hundred-thousand-dollar improvement and expansion program, involving the adaptation of a 275,000-square-foot building into a modern cold rolling plant, was completed recently at Spaulding Works of Crucible Steel Co. of America. Three years of construction, re-equipping and fitting are represented by the new Harrison, N. J., facility, now in production on cold rolled alloy, stainless and high-carbon steel specialties. Increase in capacity over the former level is expected to reach 40 per cent within a few months.

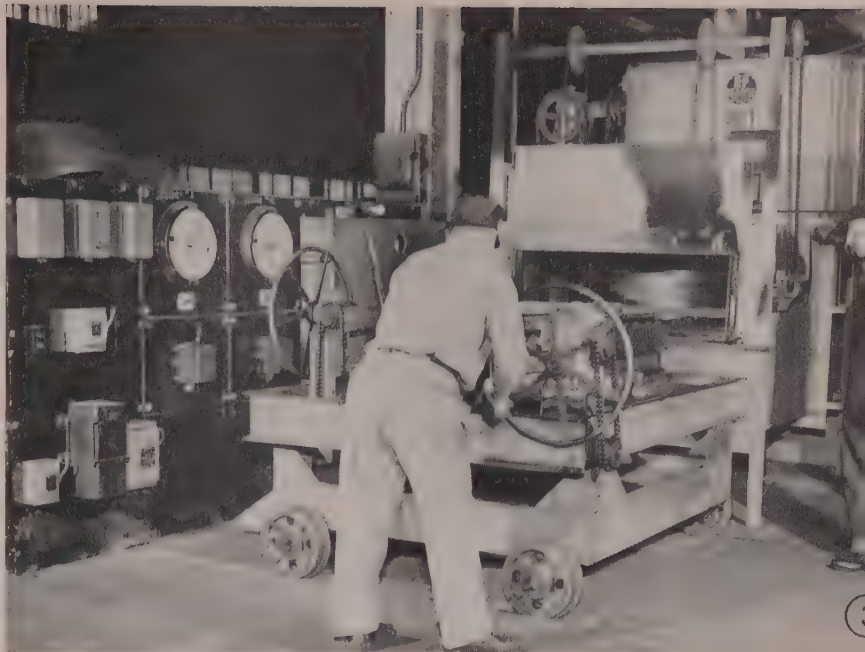
Cold rolling and special products

divisions, in addition to a new precision casting department, welding rod production unit, research laboratories and the company's eastern seaboard warehouse, occupy the major part of the ordnance center plant area known formerly as the Atha Works of Crucible Steel. The plant employs approximately 1000 persons.

Operations of the cold rolling division are integrated into one special plant. Layout was designed by W. D. Gross, works manager and R. G. Bennewitz, superintendent of the cold rolling division. Most of the raw

Fig. 2—After stainless steel is annealed, the ribbon-like strands are cleaned in these long vats of warm, electrically-charged sulphuric acid. From the acid they are run through sprays of water and scrubbers, and then immersed in hot water. This fully automatic process is known as strand pickling

Fig. 3—Principle of this new automatic pusher-type annealing furnace is to heat coils of highly-polished cutlery and specialty steels—thousands of pounds at a time—without exposing them to any direct flame. This furnace eliminates the necessity for pickling or cleaning after annealing



material comes to the division for processing in the form of hot rolled coils of stainless, alloy and high-carbon steels. The plant is set up for straight-line production. Overhead cranes serve every part of the production and material's-handling area. In many cases the coils unwind and rewind automatically as steel is annealed, cleaned, rolled, polished or otherwise processed.

Fifteen new cold rolling mills were installed. Bennewitz mills, designed by the division superintendent and named for him, are used extensively. These machines can roll up to 1200 feet of strip steel per minute, to thicknesses down to 0.004-inch without spread. Thus the steel is kept to exact measurements in thickness across the strip.

Before and during rolling, the steel may have to be annealed several times to condition it for continued processing. This is done by means of automatically controlled annealing furnaces, some of them designed for bright annealing.

Some strip steel is heat-treated by

means of multiple passes through molten lead. In one case, the strands of steel are passed through a hardening bath of liquid lead at 1550° F, quenched in molten lead at 650° F, cooled in air over a network of pulleys, and finally tempered in a 750° F lead bath. Or, cold rolled steels may be heat-treated in a gas furnace, chiefly employed for stainless, at temperatures up to 2000° F.

Pickling Facilities

Steel is cleaned principally by means of pickling facilities set up for straight-line mechanical operations. Some of the steel is pickled while in coil form. A good part of it is "strand pickled"; coils are wound and rewound as the strip passes through the bath in continuous ribbons.

Special products division is devoted to the development and manufacture of permanent magnets, precision castings as well, cast alloy tools and special metal products. The plant turns out hundreds of thousands of Alnico magnets per month, cast in many shapes, some of them intricate and some of them very large, for use in radio, television, radar and other electronic equipment. The new precision castings department employs

the "lost wax" process to cast intricate metal parts in alloy materials where it is not practical or desirable to carry through further extensive machining or shaping processes.

New Gas Turbines Use Gas, Oil for Fuel

Three new 5000 kw gas turbines—generator power plants, expected to be among the most powerful and most efficient units in this country, have been ordered by two electric utility companies, Public Service Co. of Oklahoma and Bangor-Hydro-Electric Co. of Maine. Built by General Electric Co., Schenectady, N. Y., the turbines will use natural gas for fuel in Oklahoma and bunker fuel oil in Maine. Both units will convert energy from fuel directly into electric power without the use of intermediate means such as boilers and condensers.

Each unit will consist of two gas turbines, one driving a low-pressure air compressor, the other driving a high-pressure compressor. The high-pressure turbine will drive a conventional steam turbine-type generator through reduction gears. Intercoolers will be used between the two stages of compression to reduce the power needs of the compressors and waste heat from the exhaust will be used as a regenerator to increase efficiency. The power plants will be equipped with oversize, 6000 kw generators to permit increased loading during periods of low ambient temperatures.



Fig. 4—These high-pressure gas furnaces insure accurate annealing of steel coils before cold rolling or drawing. A stainless steel shell protects steel from any direct flame. Inert gas drives out all air which contains scale-producing impurities

avoid a bottleneck which might occur at this point. The units, shown in Fig. 6, are special machines built by Culligan Zeolite; they are manually operated and are provided with hoods to remove fumes from the hand arc welding. When a tank is inserted in the leak tester, rubber gaskets seal off the two holes in the tank top but permit 30 pounds of air to be admitted through the single hole in the tank bottom. The tank is then immersed in water. Leaks detected in seam or girth welds are repaired as required until the tank is made air tight.

When a tank has passed this test, it is released from the machine and pushed through the back onto one of three roller gravity conveyors to move on to the ring welding machine, Fig. 7. The ring serves the tank as a base and protects the bot-

tom from injury in handling or moisture present on the floor when the water softener is installed. This ring is slipped onto the bottom of the tank—to exact position by gage and is hand arc welded at four equally-spaced points. Each weld is 2 inches long.

Rings welded to the tank bottoms are made from 12-gage strip steel on a Warco 75-ton crank punch press, Fig. 8. First operation is to punch six holes in the blank which is $3\frac{1}{4}$ inches wide and $28\frac{5}{16}$ -inches long. Second operation consists of spanking over $\frac{1}{2}$ -inch of one edge slightly more than 45 degrees. Third operation is to crimp the spanked edge down tight. Fig. 8 shows the press set up for the second and third operations. Fourth operation—in itself three separate operations in a progressive die—is to form the ring.

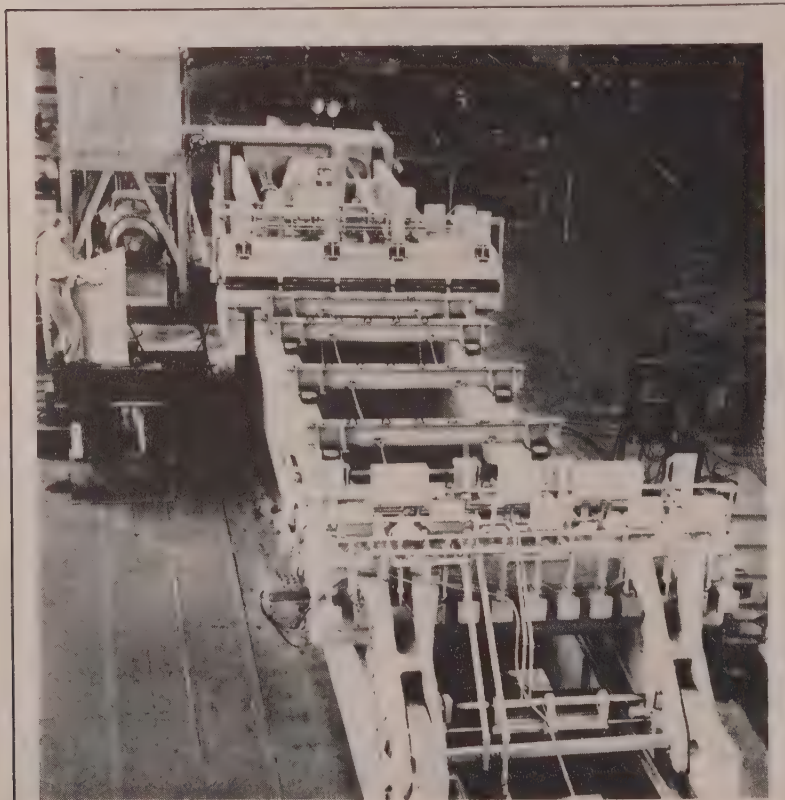
First step in the latter is to bend a curvative in the two ends to fit the second die; second step is dieing the steel into a U shape to fit the third die; and third step is forming the ring to a perfect circle. Arc welding the joint to form a solid ring is the fifth and final operation.

After the ring is welded to the tank bottom in the ring welding machine, the tank is deposited on one of two standard gravity roller conveyors, shown at the upper right of the welding operator in Fig. 7, and moves to the grinding department. Here two flexible shaft grinders are provided for smoothing off all welds. Adjacent to the grinding area is a tank length gage which is employed frequently to check finished tanks for established overall length of $44\frac{1}{2}$ inches. Production machines are kept set to maintain this length to within plus or minus $1/16$ -inch.

Galvanizing—Finished and inspected tanks are loaded on skids and moved to the shipping dock for truck delivery to a job galvanizing shop where they are hot dipped galvanized inside and outside. Coating is applied to a thickness of from 2 to 4 mils and in conformance with hot dip range boiler specifications. From the galvanizing shop, tanks are returned to the company's main plant where two additional operations are performed to ready the tanks for attachment of pipe fittings and charging with zeolite.

One of these operations—that of attaching to the tank head a nickel silver plate to carry the company name and serial member—is unique and interesting. The tank is placed in a horizontal position head end forward in a special machine, Fig. 9, and held firmly against a fixture by 80 pounds pressure applied to an air cylinder bearing against the tank bottom. Mounted in parallel position on a hinged element of the fixture are two Nelson electric stud welding guns. A hollow-core stud is inserted in each gun chuck and porcelain ferrules slipped over the studs. By air pressure the gun fixture is raised to slightly above horizontal and the guns weld the studs to the tank head. When the gun fixture is lowered, the porcelain ferrules remain on the studs and are fractured off by tap of a hammer. Purpose of the ferrules is to insulate the gun chucks in the holding device and to control splatter in the welding operation.

Features of this method of attaching the studs are the small size of the studs—said to be the smallest used in the gun process—and the fact that they are applied to a galvanized rather than a bare steel sur-



REMOTE CONTROL OPERATED: This stretcher-leveller, shown on the test stand after shop erection, has a capacity of 1000 tons and will handle plate and sheet up to 11 feet wide and 31 feet long. Bed of the oil hydraulic type machine, made by Hydropress Inc., New York, for a plate mill, is of welded construction which absorbs all stretching forces. Main griphead is actuated by the hydraulic stretching cylinder, while other griphead is movable to compensate for plate length. All movements and actions are performed by remote control

ace. However, experience has demonstrated that the method is completely reliable and economical. The nameplate is applied simply by slipping it over the studs and flattening down the latter with hammer and punch.

With the tapping of the three $\frac{3}{4}$ -inch holes, two in the head and one in the bottom, the water softener tanks come to their final operation. At one time, each spud was tapped separately, but through use of a specially-designed machine, Fig. 10, the three spuds now are tapped simultaneously. Tanks are chucked in the machine in a horizontal position and are handled through at the rate of 60 per hour. This spud tapper, as well as the previously-mentioned shell welding machine, hydraulic head setter and the two girth seam welders, were built by the Penn Tool & Machine Co., Danville, Ill.

Fabrication now complete, the tanks have their pipe fittings attached and are transferred to the department where they are charged with zeolite and otherwise made ready for shipment to water softener distribution centers and service agencies.

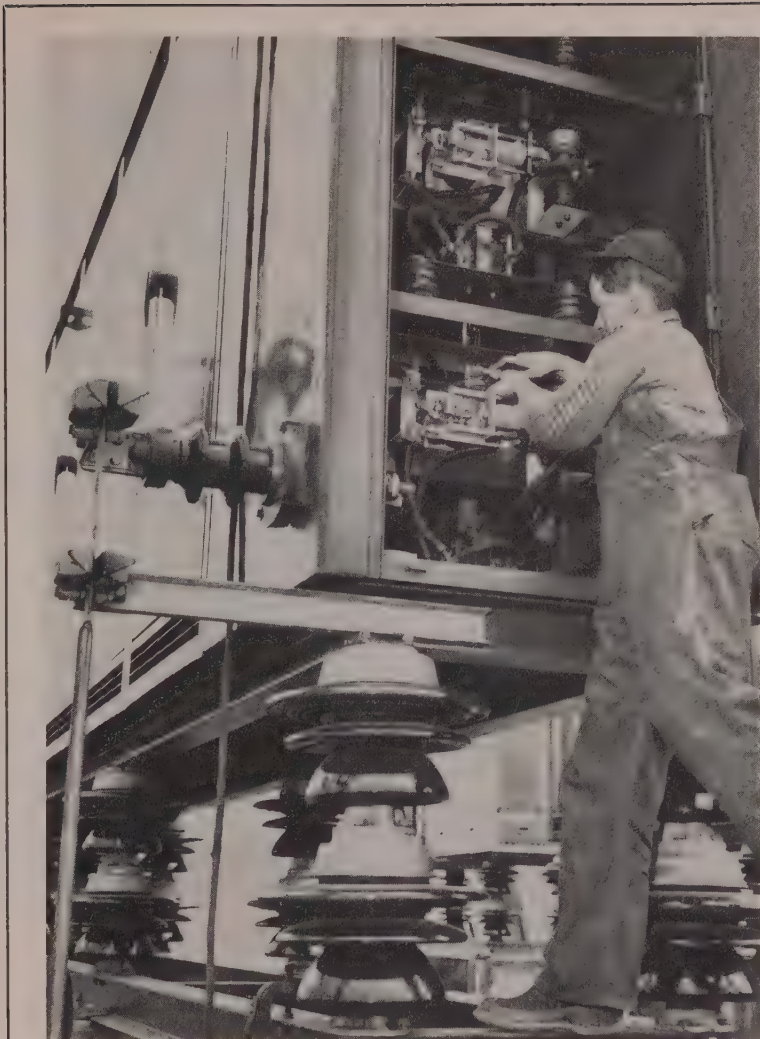
Publication Lists Firms Seeking Inventions

Manufacturers are invited to list the type of new products they are in the market for in the "Inventors' Sales Bulletin," published by *Science and Mechanics* magazine, Chicago, which circulates among inventors having patents for sale. The service consists of a special 32-page brochure which gives a list of 106 firms offering to buy accepted inventions. Under each firm's name and address is given the type of product wanted.

The bulletin sells for \$1.00 per copy and is published at frequent intervals. No charge is made for the announcements of manufacturers.

Controlled Drying Improves Clay Retorts

Controlled drying may be beneficially applied to the manufacture and quick testing of the clay retorts used in the production of zinc by distillation. This fact was brought out by R. R. Furlong, foreman of the pottery department, and D. H. Wertz, ceramic engineer of the Donora Zinc Works of American Steel & Wire Co., Donora, Pa. They presented results of planned studies before the annual meeting of the American Institute of Mining and Metallurgical Engineers



VOLTAGE BALANCER: Workman installing controls for a 10,000 kilovolt-ampere series capacitor made by Westinghouse Electric Corp., Pittsburgh, for Duquesne Light Co., same city. This capacitor, one of the largest series units ever installed on a 66-kilovolt line serving four 10,000 kilovolt-ampere electric furnaces and a heavy steel mill load, has improved regulation and reduces voltage flickers to negligible values

in San Francisco, earlier this month. Described was how the drying cycle of the freshly extruded retorts has been reduced from 45 to 4 days with assurance that drying conditions can be duplicated.

Prior to drying, the retort is cylindrical in shape, 58 inches long, of 9-inch internal diameter, with $1\frac{1}{8}$ -inch side walls. One end is closed and approximately 2 inches thick. Moisture content of this "green" retort is about 17 per cent, meaning a removal of 30 pounds of water per retort. The controlled drying process depends upon the circulation of a large volume of conditioned air at low velocity. Numerous zinc furnace

tests reportedly have not shown any failure of retort which could be associated with the quick-drying process.

—o—

Industries in the Metropolitan Detroit area have made, or will make, improvements aimed at abating industrial waste pollution estimated at over \$6,000,000. This was brought out as a result of technical investigations of the pollution of boundry waters conducted by the International Joint Commission, a U. S.-Canadian body established under the terms of a 1909 boundary waters treaty between the United States and Great Britain.

department, aptly point up the prompt shipment which the company gives its customers on renewal parts orders to lessen the severity of machine outage.

The production manager of a large metalworking plant in Louisville, Ky., telephoned the renewal parts department one day recently at 10 a.m. urgently requesting a replacement tube for one of the company's electronic-type adjustable-speed drives. Less than 30 minutes after the call was received, the tube was ready for air express shipment. It left Cleveland on a regularly scheduled commercial transport plane at 2 p.m., arrived 2 hours later in Louisville, where the customer was able to pick up the shipment in person.

To surround its renewal parts with a wide margin of protection against damage or corrosion in storage or shipment, Reliance uses special packing techniques. These vary to some degree, depending upon the nature and type of part in question and whether its destination is domestic or foreign. To meet average requirements, the following procedure has been adopted as standard:

1. Coating machine surfaces with quick-drying nonoxidizing rust-preventive solution by dip, brush or spray.
2. Wrapping part in paper and sealing with tape.
3. Inserting part in fiberboard carton and stuffing container with excelsior.
4. Wire-stitching bottom and tape-sealing top of carton.

With some of the smaller armatures, special care is taken to make certain that they fit tightly in cartons. The armature rests on wooden blocks at each end, and four triangular-shaped corner wedges are inserted around it in the carton. End blocks and corner wedges are cut from scrap lumber.

Armatures too large or too heavy to be packed in cartons are similarly braced for shipment in wooden boxes, which are constructed to the size required for an exact fit. Hence, a large, heavy armature is given maximum protection in this manner against damage in shipment as the part is prevented from being moved, turned, or "bounced around" within the container.

Packing Sequence Followed

For armatures and other parts of special motors used to power coal-mining equipment, as well as for foreign shipment of standard motor parts, the following packing sequence is employed:

1. Windings are painted with special insulating enamel and exposed machined surfaces coated with antirust solution.
2. Commutator is wrapped tightly with corrugated paper, then taped.
3. Complete unit is covered with U. S. government grade C cloth paper, which is really a fabric impregnated with a special wax designed to render the contents waterproof.
4. Part is placed in air-tight but-var bag, air is removed by

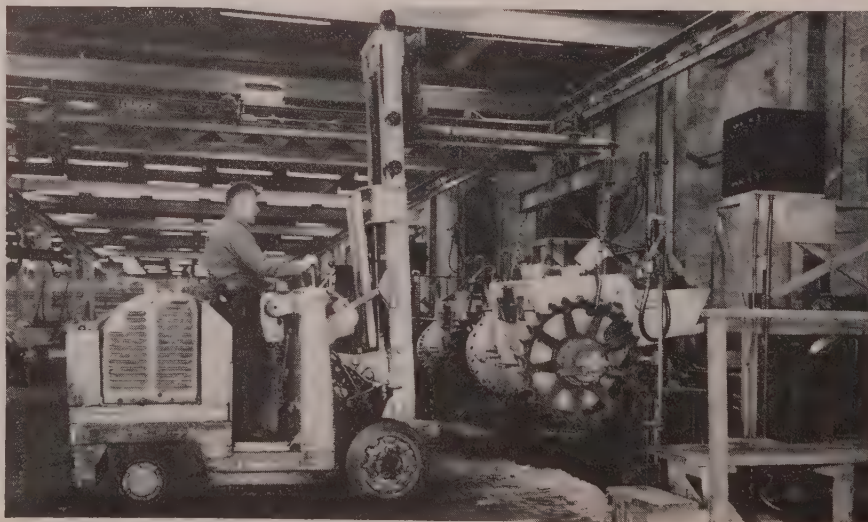
vacuum, and package is heat-sealed.

5. Package is placed in metal or commercial wooden box which is stencilled with required markings.

The following procedure is used for export packaging of small mechanical parts up to certain sizes packed in cartons:

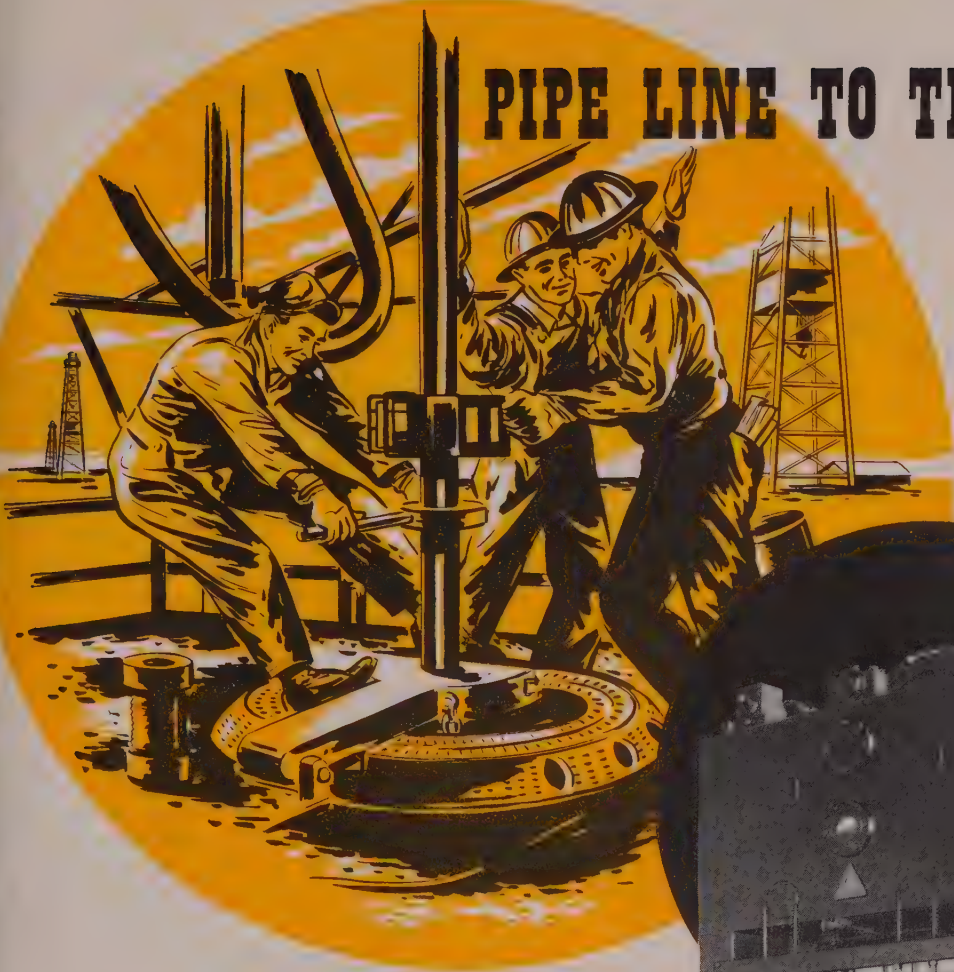
1. Rust protection treatment of machined surfaces.
2. Wrapping of part in waterproof paper and imbedding it in moistureproof shredded parchment paper.
3. Placing of part in carton, which is tape-sealed.
4. Applying U. S. government grade C cloth paper.
5. Coating container with amber-colored microcrystalline wax, which complies with U. S. government compound sealing dip coating specification JAN-P-115.
6. To protect grade C paper and wax film, package is wrapped in transparent wax paper.
7. Complete unit placed in wooden crate for shipment.

A safe trip for resistors and similar fragile components also requires special protective treatment. These parts are often mounted on special panels. The board is wedged in wood on both sides with small posts or blocks to prevent it from moving while in transit. As a result, neither top nor bottom of the wooden crate ever touches the product. Small parts for drive motors which do not demand extra protection against damage or corrosion in shipment and storage are packed in mailable-type cloth bags.



SLINGING WITH A FORK TRUCK: Heavy, odd-shaped diesel motor gear trains, such as the one shown, are handled in the Decatur, Ill., plant of Caterpillar Military Engine Co., with this special sling attached to a Yale fork lift truck. Sling is comprised of a piece of channel iron secured to the upper surfaces of the forks by L-shaped bolts. A hook attached to the center of the channel supports two heavier channels welded back to back and equipped with three chains

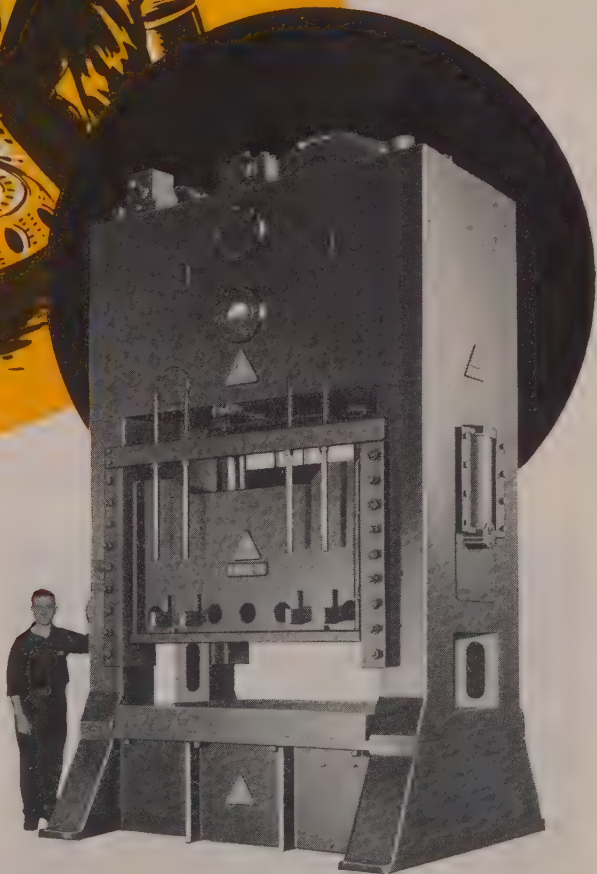
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By GEORGE A. ROBERTS

Chief Metallurgist
Vanadium-Alloys Steel Co.
Latrobe, Pa.

PRODUCTION OF Tool Steel

Principal operations in the manufacture of tool steels are simple and few in number, while details and precautions necessary in the production of a superior product are many and vary greatly throughout the industry

TOOL STEEL is produced primarily for use as tools to cut or shape articles used in all types of manufacturing operations. Steels will vary in chemical analysis depending upon the end use, from plain carbon types with no appreciable alloying elements added to high speed cutting types containing as much as 45 per cent of alloying elements.

Manufacture of tool steel has only within recent years become more of a science than an art but by no means has complete scientific control fully re-

placed the art. Chemical processes in melting are fairly well known and there have been remarkable strides in temperature control throughout all heating operations, but a hammerman or a roller still becomes good only by mastering the art of the operation and not through scientific training. Tool steel is still made in comparatively small batches and orders for one size or composition are often of only a few hundred pounds in weight. Thus, much of the cost of the manufacture of tool steel is involved in forging, rolling, annealing and inspection of small lots of many compositions. Tool steels are "tailor-made," and it requires much more supervision and patience to manufacture small lots uniformly than it does large tonnages. American tool steel manufacturers have done a remarkable job in producing a product of uniformity.

Principal operations in the manufacture of tool steel are simple and few in number, while details and precautions necessary in the making of good tool steel are many and vary greatly throughout the industry.

Over 90 per cent of all tool steel made in America is melted in basic electric furnaces. Small amounts are melted in coreless induction furnaces and basic open hearths. There are no American companies at present operating crucible melting furnaces.

In 1740 Huntsman, in order to obtain a more uniform steel, melted carburized blister steel in a crucible. The first tool steel company was established in 1751. Mushet, early in the last century, substituted refined iron for blister steel scrap in his crucible mix. Charcoal was added to furnish necessary carbon in the steel, and the mixture was melted to form "cast

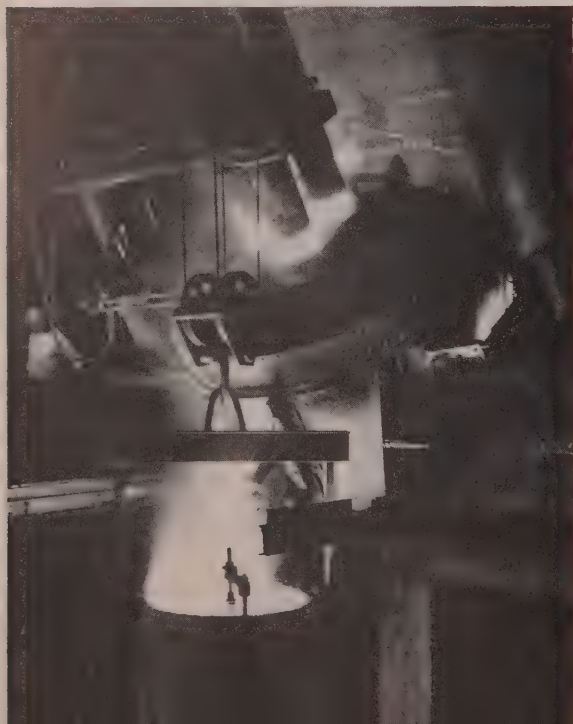


Fig. 1—Tapping an electric arc melting furnace

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The cooperative experience and close relationship of the two divisions has proved advantageous to McKee clients in both industries.



ARTHUR G.

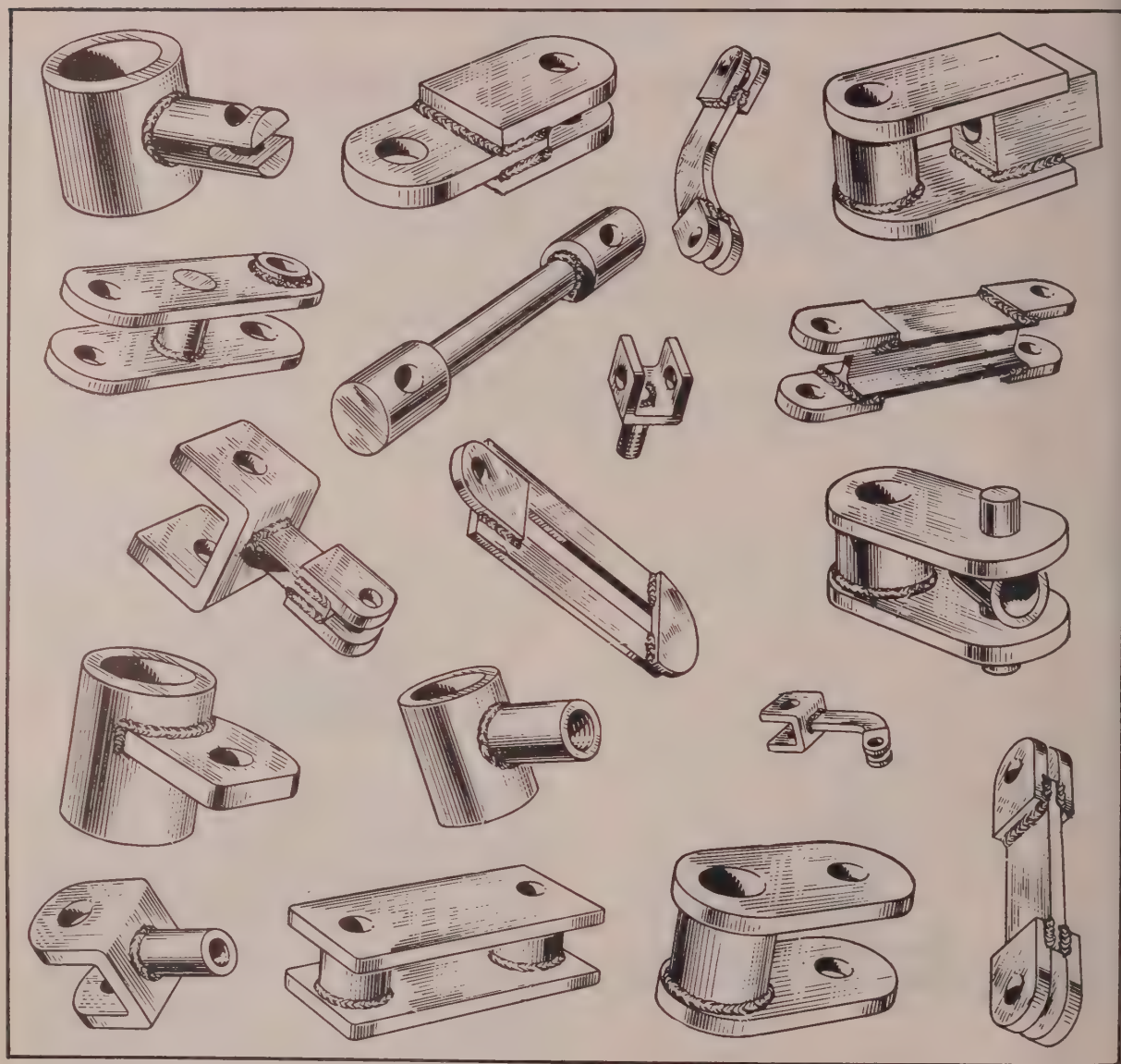
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efficiently in all quantities using steel plate and standard mill shapes and forms.

More detailed data on the design of links and other machinery parts for arc welding is contained in the "Procedure Handbook of Arc Welding Design and Practice." Price \$1.50 postpaid in the U.S.A., elsewhere \$2.00.

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PRODUCTION OF Tool Steel

steel," as it later became known. From that time on, progress in the manufacture of tool steel was relatively slow until the advent of modern analytical chemistry furnished the means necessary for production of quality steel.

The first attempt on record to melt steel electrically dates back to 1878 when Siemens conducted his initial experiments with arc melting in a small crucible. During the next 20 years progress in electric melting was slow, and probably the most noteworthy event during this period was Heroult's development, about 1890, of a furnace for the production of ferroalloys. Beginning about 1900 development of electrical furnaces gained momentum. Most promising was the direct arc type devised by Heroult. The first heat of electric furnace steel was cast in America by Read in 1906.

From the first crude furnaces improvements in mechanical and electrical features, electrodes, introduction of automatic control, increase in power, modifications to facilitate charging, increase in power input, and finally use of multivoltage transformers have made the arc furnace a practical tool.

The electric arc furnace proper consists of a cylindrical steel shell lined with refractories. A roof is placed on the shell like a cap and is detachable. The furnace is mounted on a trunnion at the front end directly under the pouring spout while the furnace back is supported by rods which may be raised to tilt it during tapping of the heat. Graphite electrodes are suspended through holes in the roof and are three in number in all except very large furnaces which sometimes utilize six.

Furnace bottom is made up of a heavy steel plate riveted or welded to the cylindrical shell. This plate is covered by several layers of magnesite brick onto which the hearth, which must be of basic refractories such as magnesite or burned dolomite to withstand the lime slags used in the basic process, is rammed. The hearth is made up by either ramming in refractory material mixed with binders, such as sodium silicate, molasses, or tar and burned in as a whole, or else by burning in layer by layer the refractory material mixed with oxide basic open hearth slag and mill scale. Burning in is performed by heat of electric arcs formed between the furnace electrode and pieces of broken electrodes placed on the hearth.

Walls and roof are, for economic reasons, lined with silica brick since there is no contact with slag and resistance to high temperatures being an important requisite.

Melting of a heat is started by charging necessary raw materials into the furnace. This is accomplished by shoveling materials in through two doors, one on either side of the furnace, or by lifting the roof slightly, swinging it to one side and dropping in the charge from a bucket suspended by a crane. Large furnaces of from 50 to 100 tons capacity have doors large enough to allow charging with a charging machine as is the practice with open hearth furnaces.

Tool steels are practically all produced by what is



George A. Roberts attended the U. S. Naval Academy for two years and completed his studies at Carnegie Institute of Technology, Pittsburgh, receiving the following degrees: B. Sc.; M. Sc.; D. Sc. In 1938 he was associated with the Bell Telephone Laboratories as a laboratory technician. From 1941 to date, Dr. Roberts

has been employed by the Vanadium-Alloys Steel Co., first as research metallurgist and as chief metallurgist since 1945.

He has published a number of technical papers and a book on tool steels. Subjects in which Dr. Roberts is interested include heat treatment and physical metallurgy of steel; alloy steels, and powder metallurgy.

At present he is a member of the executive committee and vice chairman, Pittsburgh chapter A.S.M. Other technical societies of which he is a member are American Institute of Mining and Metallurgical Engineers; American Iron and Steel Institute, American Society of Tool Engineers; American Chemical Society, Sigma Xi and Tau Beta Pi.

known as the dead melt practice. This means that a high percentage of scrap of nearly the same chemical analysis as the finished heat must be charged. A typical charge for a heat of 18-4-1 high speed steel will consist of about 1 per cent burnt lime, 45 per cent 18-4-1 scrap, 5 per cent calcium tungstate, 9 per cent ferrotungsten, 3 per cent high-carbon ferrochrome and 37 per cent low carbon sheet and plate scrap. A charge of this type will melt down slightly lower in alloying elements than the desired chemical analysis, allowing small final additions of alloying

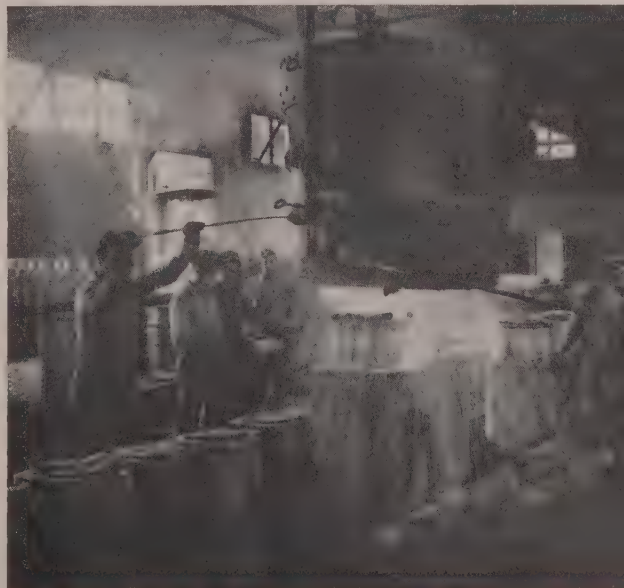


Fig. 2—Teeming liquid metal into ingot molds

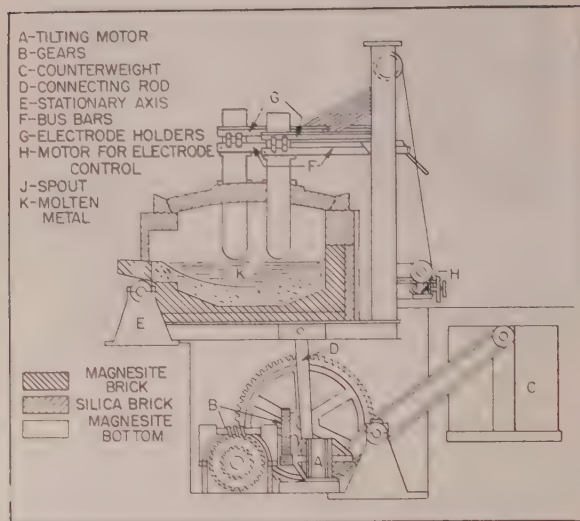


Fig. 3—Sketch of an electric arc melting furnace—
Metals Handbook, 1948

elements to be made to bring the heat within desired chemical specifications.

After furnace is charged, electrodes are lowered and electricity is turned on. Automatic controls position electrodes throughout the heat, maintaining proper arc length for the voltage applied. During the melting period voltage is kept as high as possible in order to speed the melting process. As melting proceeds, furnace helpers occasionally push unmelted scrap off the banks, or hearth sides, until melting is complete.

When the charge is entirely liquid after $1\frac{1}{2}$ to 2 hours the voltage is reduced to a point where the charge will maintain a temperature of about 2800 to 2850° F and the melter starts working the heat. This consists of making proper additions to the slag since chemical reactions between the slag and the metal determine final physical and chemical properties of the steel. Slag at the end of the meltdown will be oxidizing and rather thick. Judicious additions of fluorspar, which thins slag, and burnt lime, which thickens slag, are made throughout the heat's refining period in order to maintain the proper slag consistency.

Because of the charge makeup, there is no reason to continue with an oxidizing slag after meltdown. Consequently the melter starts to build a reducing slag immediately. This is accomplished by proper additions of calcium carbide, pulverized graphite and burnt lime. These latter additions are made gradually over a period of 2 to 4 hours. This reducing of the oxidizing slag is characteristic of the dead melt process used for tool steel melting in order to conserve alloying elements. During the refining period as the slag becomes more and more reducing, metallic oxide content of the slag will drop from about 45 per cent to less than 1 per cent exclusive of aluminum oxide of which 3 to 5 per cent will always remain in the slag. The reduced metals, iron

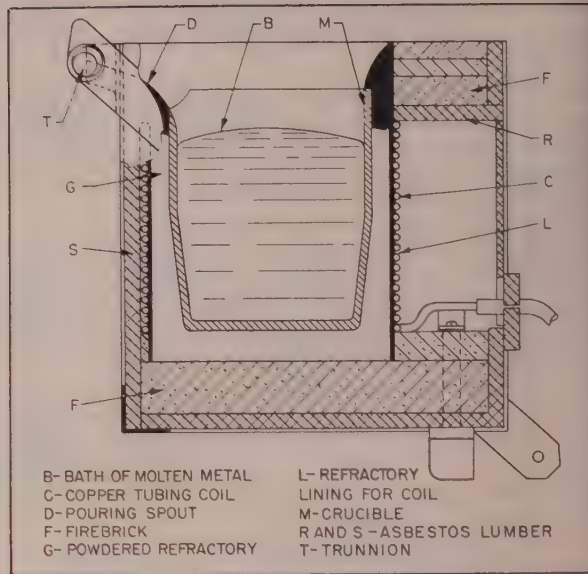


Fig. 4—Cross section of an electric induction furnace—
Metals Handbook, 1939

or alloying elements, are returned to the steel bath by the operation. The melter shapes up the slag as refining progresses by observing color and general appearance of a small sample occasionally dipped from the furnace, cooled and fractured. An oxidizing slag is black and solid while a final reducing slag is a white powder after cooling.

As the refining period progresses, the melter will frequently rabble the heat with a steel rod in order to increase the chemical reaction rate between the slag and metal. While slag is being shaped up there are frequent test samples of the metal withdrawn from the furnace and sent to a chemical laboratory for analysis. On the basis of the results of these analyses, necessary final additions of alloying elements will be made to the bath starting about 20 minutes before the heat is to be tapped. After these additions are in, final deoxidizers, such as ferrosilicon, calcium-silicon, and perhaps one of the proprietary complex deoxidizers will be added. While these additions are being made the melter brings the bath to correct tapping temperature of 2875 to 2925° F by slightly increasing the voltage.

Most deoxidation is done in the furnace before the heat is tapped in order to allow resulting oxides more time to form and rise into the slag while the bath of liquid metal remains relatively shallow. Deoxidation is necessary because iron oxide in solution remains in the liquid metal even though the bath has been under a reducing slag. Deoxidizing agents previously mentioned all have a higher affinity for oxygen than does iron, thus they are able to reduce most of the dissolved FeO and form other oxides which tend to float up and become part of the slag.

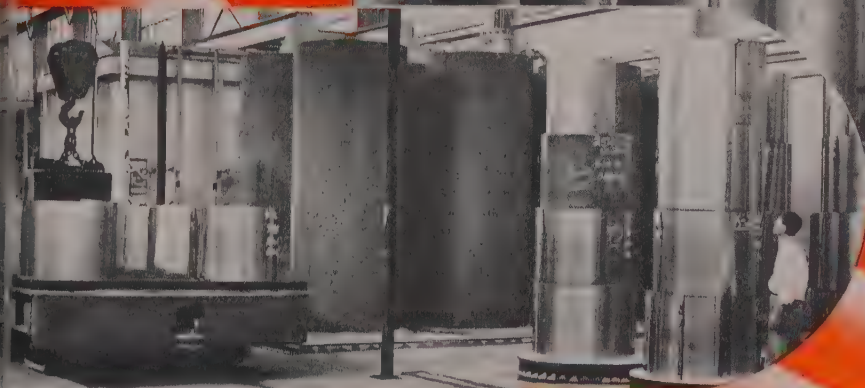
The ladle, a refractory lined bucket-shaped vessel preheated to about 1200° F, is suspended below the furnace spout with a crane. When the metal has reached proper tapping temperature, the furnace is tilted slowly and drained into the ladle. The crane

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PRODUCTION OF Tool Steel

then carries the ladle of metal and slag over to the ingot molds. After holding the metal in the ladle for a period of from 5 to 20 minutes, depending upon weight of the heat, to allow slag to float to the top and temperature of the liquid metal to drop somewhat, teeming is begun.

The electric induction furnace is essentially a transformer with the metal acting as the core or secondary. It consists of a crucible, usually made of magnesia, surrounded by a layer of tamped in magnesia refractory. Around this is a core made of copper tubing, forming the primary winding which is connected to the current source. The whole is encased in a heavy transite box with a silica brick bottom lining. A lip is built into the box top in the front to allow metal contents to run out as the furnace is tilted forward.

Induction melting is essentially a remelting process since little effort is made to maintain or control the slag. The charge will consist of scrap of the approximate analysis desired plus necessary ferroalloys to give final chemical analysis within specifications. Scrap may be of any size which will fit into the furnace. It may be necessary to melt down part of the charge before the remainder can be put into the furnace if scrap is bulky, such as turnings.

When the furnace is charged, a high frequency current is turned on. The current passes through the copper tubing, which is water cooled during operation, inducing a much heavier secondary current in the charge, thus heating by resistance. Most installations in use for melting tool steel use 960 cycle current.

Heat is generated in the outer part of the charge and carried by conduction, which is rapid in metals, to the center. After a pool of liquid metal is formed on the furnace bottom, the induced current causes a stirring effect which washes the liquid metal against solid metal greatly increasing melting speed. With

CHEMICAL ANALYSIS OF SEVERAL REPRESENTATIVE
TOOL STEEL TYPES

Type	C	Si	Mn	W	Cr	V	Co	Mo
Plain Carbon	0.80-1.40	0.25	0.25					
Cold Work	1.00	0.25	1.25	0.50	0.50	0.20		
Die Steel	1.40-2.40	0.35	0.25		12.00	0.80		
Hot Work	0.30-0.50	1.00	0.30	1.25	4.75	0.50		1.25
Die Steel	0.30-0.50	0.30	0.30	9.00-14.00	3.50	0.50		
High Speed	0.50-0.80	0.30	0.20	18.00	4.00	1.00		
Steel	0.80	0.25	0.20	6.50	4.00	2.00		5.00
	0.80	0.25	0.20	1.50	4.00	1.00		8.50
	0.80	0.30	0.20	21.00	4.50	1.50	12.00	0.50

a power input of 300 kilowatts it is possible to melt down a 1000-pound charge in 45 minutes. When the entire bath is molten, it can be seen that the stirring action of the induced current moves all of the liquid steel with no "dead spots" within the bath.

Because melting is so rapid, there is only a slight loss of oxidizable elements. A mechanical difficulty caused by convexity of the top of the bath from the stirring action makes coverage by a slag quite difficult. With selected scrap there is little need for a slag since surface of the liquid metal exposed to air is small in relation to its volume.

After melting is complete, metal is superheated to the tapping temperature in about 15 minutes. While the melter is obtaining the proper temperature he makes necessary small additions of alloys or deoxidizers. Rapidity of operation practically eliminates the possibilities for preliminary analyses to be made. When the proper temperature is obtained, furnace is tilted and liquid metal runs out over the lip into a ladle or directly into the mold.

Teeming, or filling of the ingot mold with liquid steel, is accomplished through a refractory nozzle set in the bottom near the side of the ladle. This nozzle is opened by a system of levers located on the outside of the ladle and connected to a stopper rod protected by refractory sleeves which extends down through the molten metal. On the end of this rod is located a refractory stopper which fits inside the nozzle well. Amount of metal flowing through the nozzle can be controlled by the distance which the stopper is raised out of the nozzle well. The ladle is held over a mold by the crane while the mold is being filled.

Three types of ingot molds are used by the tool steel industry. The plug-bottom type in which the bottom of the mold cavity is rounded with a hole in the center in which a refractory, cast iron or copper tapered plug is placed; the open-bottom type which is placed on a stool of cast iron or copper, the stool forming the bottom of the mold cavity; and the smaller split mold made in two halves which are held together by encircling rings.

All three of these types are big end up molds in which the mold cavity is largest at the top and tapers down to the bottom. The mold cavity may be square, rectangular, hexagonal, octagonal, or fluted round in cross-section. The mold is cast iron with walls thicker at the bottom to aid in the desired progressive solidification of the ingot from bottom to top.

Many sizes of molds are used, depending upon chemical analysis of the steel and size of product to be made from the ingot. Mold cavity cross-section

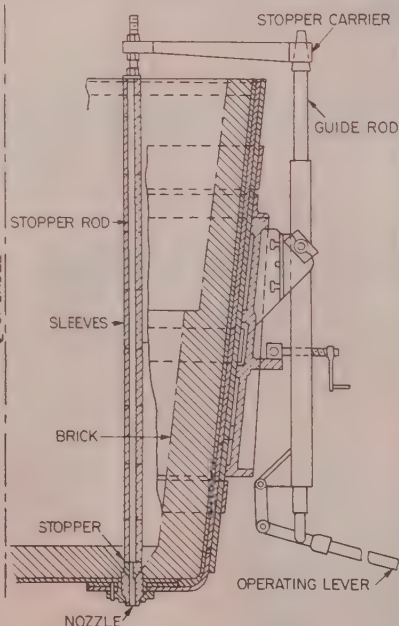


Fig. 5 — Section
of a bottom pour
ladle — *Metals
Handbook, 1948*

for the different sizes of ingots will range from 4 to about 30 inches and height will vary from 20 to 60 inches. A typical mold might be of such size as to yield an ingot 10 inches square at the bottom, 12 inches square at the top and about 40 inches long, not including the hot top.

When molds are prepared for teeming, the cavity is coated with resin smoke, tar or pitch, or painted with a lacquer containing aluminum flakes. The coating protects mold surface from erosive action of liquid steel somewhat and helps to prevent sticking of drops of molten metal which splash, especially when the stream first hits the bottom of the empty mold. Molds are set up in a row, usually in a pit from 1 to 4 feet deep, for convenience in teeming. Shortly before the heat is to be tapped mold cavities are inspected and cleaned if necessary.

Before filling the mold with liquid metal a refractory hot top, a box-shaped refractory with no bottom, about 6 to 12 inches in height, is placed on top of the mold. In some cases the hot top is preheated to about 1200° F. Hot top capacity is usually 15 to 20 per cent of the mold capacity.

Liquid metal fills both the mold and hot top. Because the hot top is refractory, metal in it remains molten until the ingot has solidified to the top of the mold. By remaining liquid until the ingot proper has solidified, the hot top metal can feed down and fill any voids which tend to form as the ingot shrinks during solidification. In fully killed, or deoxidized, tool steels, the aim is to obtain a solid ingot with no shrinkage cavities in the center.

Ingots are allowed to remain in the molds until they have cooled to a temperature of about 1700° F. Then they are stripped from the molds by grasping the hot top with tongs and lifting them out with a crane.

After stripping, ingots are handled in one of two ways. Either they are charged directly into heating furnaces or soaking pits preparatory to cogging or blooming, or buried in ashes, fullers earth or lime for slow cooling. Ingots cannot be allowed to air cool because their coarse, as-cast grain size, relatively poor surface, and high carbon and alloy content make them very susceptible to cracking. If ingots are slowly cooled, they are inspected and any surface imperfections which might lead to cracking are ground out before they are charged into heating furnaces.

(To be continued)

Report Helps Settle Heat Treating Controversy

Degree of subsurface hardening needed to get adequate physical properties in a steel part, a point of controversy among metallurgists, is to some extent settled by a newly published report of the Society of Automotive Engineers, New York. One group of metallurgists believes the part must be hardened all the way through (getting complete transformation from austenite to martensite) to do the best possible job, while the other group feels lesser amounts of hardening are adequate.

Investigations reported in the publication, "Physical Properties as Influenced by As-Quenched Hardness", tend to support the first group and are based on three different kinds of steels. It is stated that since design stress almost always is based on yield strength values, it seems especially desirable to get the full as-quenched hardness of which the steel being treated is capable. There seems to be no significant difference in elongation or reduction of area with respect to a change in as-quenched hardness.

Impact strength also increases as the quenched hardness is upped, states the report. Impact strength of the three steels at equal hardness values differ considerably, difference in microstructure of the as-quenched blanks partly explaining this behav-

ior, it is thought. The report, which contains 22 photomicrographs and is available to members for \$1 and others for \$2, also concludes that shot peening of partially hardened structures cannot be relied on to replace complete hardening to bolster resistance of steel.

Enamel Institute Releases Shipment Test Details

Recommended procedures and equipment for carrying out preshipment tests of packaged porcelain enameled products are contained in a booklet known as project 1, published by Porcelain Enamel Institute. The project, bearing official endorsement by national carrier associations and appliance manufacturer organizations, has grown out of the packaging and shipping committee of the institute whose purpose was to develop and secure adoption of suitable tests and testing equipment for determining, before shipment, the ability of packaged porcelain enameled products to withstand transportation shocks from point of departure to destination.

Carriers have agreed to parallel the committee's safe-transit program with improvements in facilities and education of employees in proper handling of enameled products. Recommended tests are the impact or longitudinal shock test and the vibration or vertical shock test.

Severity and duration of tests were approved by the carriers on a tentative basis as simulating normal transportation and handling hazards and, in effect, have created specifications for what may later become a "certified" safe package.

Production Vise Offered For Manufacture or Sale

Adaptable for the heaviest types of machining operations or the lightest assembly operations, a new production vise can hold securely without crushing, the most delicate castings, including plastics. High pressures are said to be made possible by a compounded toggle arrangement. A simple adjustment allows pressures of an ounce to many thousands of pounds, with instantaneous lock-up and release.

Foot pedal arrangements which leave operator's hands free for work handling are possible. Due to downward pressure of hand levers, high-pressure leverage may be used, limited only by the body construction of the vise. Thus, it is said, pressures of 10 tons or may be obtained. The owner of the device, A. Peterson, 3914 Pine Grove Ave., Chicago 13, is willing to assign manufacture and sale on a royalty basis. It is stated that for bench assembly models where only light pressures are required, the vise can be built at comparatively low prices.

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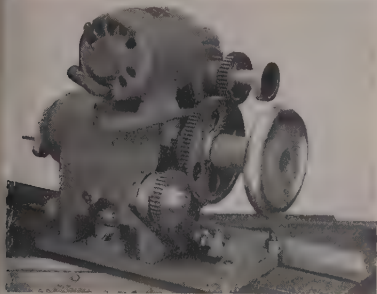
UNITED STATES STEEL

STEEL

New Products and Equipment

Relieving Fixture

A relieving fixture which can be attached to any universal tool grinding machine and which is adjustable to all precision cutting tool needs and problems is announced by Glenbard Tool Manufacturers Inc., 216 N. Clinton St., Chicago, Ill. Called the Spi-Rad, it will reproduce the exact



form on the wheel for the first time, do intricate tool work, cut down time and improve over-all machine tool production. An "on center" spiral and radial type relieving fixture, it has no limitations on the types or shapes of end-cutting contours that can be reproduced.

Left hand cut-tools can be relieved by reversing the actuating cam. The number of flutes desired, from one to six, is controlled by a quick, simple gear change. All teeth are cut in a true cycle, because of geared indexing.

Check No. 1 on Reply Card for more Details

Magnification Checker

Mirror adjustment and the magnifications of the lenses of all types of optical comparators and projectors may be checked with the ESD magnification checker, made by Engineers Specialties Division, Universal Engraving & Colorplate Co. Inc, 980 Ellicott St., Buffalo 8, N. Y. The steel balls and pin of the checker are held to accuracies of 0.000025-inch in diameter. The balls suspended by spring loaded pins, are positioned at approximately a 45 degree angle, thus permitting its magnified image on the screen to be checked horizontally and vertically without repositioning the checker.

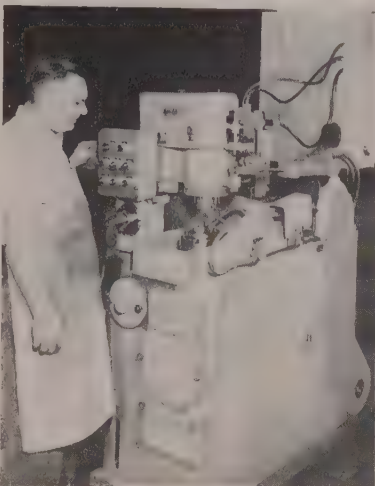
Checker is placed on the work table of the comparator and one of the four precision-ground balls or the single pin is projected and the shadow measured on the chart-gage screen. This is accomplished by the magnifi-

cation gage lines incorporated on all ESD layout chart-gages or by using the magnification checking scale. Due to the large range in sizes of the balls together with the small pin, a convenient magnification check can be made on all comparators of all screen sizes.

Check No. 2 on Reply Card for more Details

Contour Milling Machine

A vertical spindle milling head, a cam follower, a cam-carrying table and a rotary work table are combined in the new cam-controlled contour milling machine designed by Sundstrand Machine Tool Co., Rockford,



Ill. It features a wide selection of automatic cycles for both internal and external milling of practically any contour on work parts up to 5 inches in diameter. Only operator duties are to unload, reload and start the automatic machine cycle. Machine has ability to cut master cams from sample parts, thus eliminating the engineering of intricate cam profiles.

A 3/4 hp milling head and a cam follower spindle are mounted together on a swinging arm. Ratio between the cam roller arm and the cutter arm is 2 to 1 which reduces any cam error by one-half on the finished part. The cutter spindle is driven from a 3/4 hp variable speed unit, producing infinitely adjustable speeds ranging from 425 to 4150 rpm. Cutter spindle head has a 3 1/4 to 8 inch vertical adjustment. The 6 inch diameter rotary table and the cam-carrying spindle are worm driven off the same motor at a 1 to 1 ratio. Table feeds are variable from 0.2 to 5 rpm and

the rapid rate is 40 rpm. Machine has 24 possible cycle combinations.

Check No. 3 on Reply Card for more Details

Strainer Cores

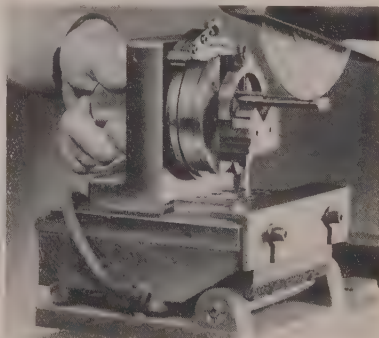
Custom made to individual foundry requirements, AISiMag strainer cores, made by American Lava Corp., Chattanooga 5, Tenn., are made of a material which is not affected by heat shock at normal molten metal temperatures. After the pouring, the strainer cores remain in the gate portion and the cores are fluxed away in subsequent remelting of foundry scrap. Cores are dimensionally accurate, requiring a tolerance of not less than 0.010-inch on each inch with no dimension less than plus or minus 0.005-inch.

Material used is AISiMag 202, a ceramic with a low coefficient of thermal expansion and exceptional heat shock characteristics. It has a tensile strength of 3500 psi and compressive strength is 40,000 psi. Flexural strength is 8000 psi.

Check No. 4 on Reply Card for more Details

Grinding Fixture

Developed to meet the need for a faster and more versatile perforator grinding attachment, the Grind-All grinding fixture, announced by Harig Mfg. Corp., 319 N. Albany Ave., Chicago 12, Ill., embodies accuracy



plus wide operating range with time savings up to 300 per cent. With this fixture, faster set-ups may be made and all types of regular and irregular contours may be ground. Many irregular shapes concentric with shank may be ground within a plus or a minus 0.0002-inch.

Adjustable stops permit swing to any number of desired degrees. A V-block located in a T-slot in the center of the index plate can be adjusted to any desired position with

plus or minus 0.0002-inch. The index plate has twenty-four 15-degree graduations with plus or minus 0.0002-inch accuracy. The fixture may be used for other grinding operations such as concave and convex radius dressing and because of its radius generating feature it may be applied to the grinding of carbide.

Check No. 5 on Reply Card for more Details

Selenium Rectifiers

Plates capable of withstanding 24 volts root mean square maximum in a reverse direction are incorporated in the design of selenium rectifiers covering the range of 2 and 150 milliamperes to 5000 v and 10,000 amp, made by International Rectifier Corp., 6809 S. Victoria Ave., Los Angeles 43, Calif. Individual plates sizes range from $1\frac{1}{4} \times 1\frac{1}{4}$ inches to $6\frac{1}{4} \times 7\frac{1}{4}$ inches. Units can be overloaded up to ten times weight and load for periods of 7 seconds or less.

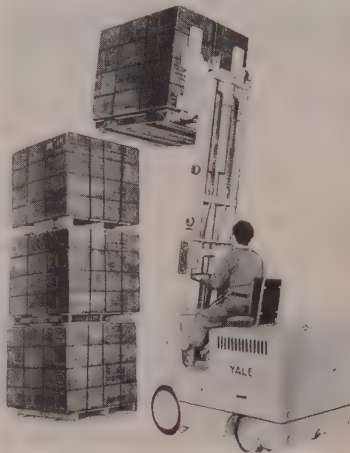
Rectifier plates are assembled in an interlocking arrangement between the plate and insulating sleeving so as to prevent possible plate rotation or lug misalignment. Efficiency of operation varies from 65 to 85 per cent, depending upon the circuit em-

ployed and the change in voltage is less than 5 per cent after the first 10,000 hours of operation.

Check No. 6 on Reply Card for more Details

Electric Lift Truck

Although only 83 inches high, the Lift-King electric trucks, made by Yale & Towne Mfg. Co., Philadel-



phia 15, Pa., will tier 48-inch high loads to the height of 130 inches from the floor to the top of the fork.

A 4000-pound load may be stacked to this height. Trucks in this line are made in capacities of 3000, 4000, 5000, 6000, 7000 and 8000 pounds. Maximum lifting height is governed by the collapsed height of specific models and their load carrying capacity. For entrance into extremely low headroom areas, there is a 68-inch high Lift-King truck with free lift of 51 inches and maximum elevated fork height of 100 inches.

Lift and tilt are achieved through a low pressure hydraulic system, pressure being supplied by an electric motor-driven pump. Truck itself has controls similar to those of an automobile. Cam-O-Tactor contactors provide four speeds forward and reverse when directional control is shifted and the foot pedal accelerator is depressed. Additional features include shockless steering, hydraulic brakes and air-cushioned safety seats.

Check No. 7 on Reply Card for more Details

Speed Nut Fastener

Savings in operations requiring the fastening of square nuts to sheet metal panels are created with the new Speed Nut announced by Tinnerman

METHODS MEN SPECIFY TAPE BY TOPFLIGHT

By specifying Topflight Tape for parts marking, many industries have eliminated costly metal stamping, hand stencilling, and other now obsolete methods. Numbers, names, symbol codes, color codes combined with numbers, instructions, warning labels, and many other necessary markings, are now being applied with printed pressure-sensitive tape.



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Cutting precision threads on J&L Electreat Steel with a two-spindle threader at Lundberg Screw Products Co., Lansing, Mich.

Steel costs are reduced 20% to 30% . . .

Heat treating of finished studs is eliminated.

Steel studs made by Lundberg for such equipment as truck axles, farm implements and diesel locomotives, must be made to exact specifications.

By using J&L *Electreat* cold-finished bars to replace higher-cost alloys, such as chrome-molybdenum and chrome-nickel-molybdenum, Lundberg not only meets the customer's specifications but also obtains *two savings*: *Steel costs are reduced*, and the *nuisance and expense of heat treating is eliminated*.

In addition—finished studs are of better quality. They are free from scale and distortion caused by "batch" heat treating. They have clean, sharp threads. Inspection rejects are reduced.

Each bar of J&L *Electreat* cold-finished steel is individually heat treated at the mill by the electric-induction process under exacting control. The flexibility of heat control in the *Electreat* process permits "tailor-made" combinations of surface and core properties to fit *your* requirements.

Many fabricators of gears, couplings, bolts, nuts, shafts and other steel parts take advantage of these money-saving qualities of J&L *Electreat*. The booklet, "*New J&L Electreat Heat-Treated, Cold-Finished Steel*," compares the properties obtained by the *Electreat* process with conventional "batch" heat-treatment and points the way to greater profits. Let us send you a copy.



Jones & Laughlin Steel Corporation
404 Jones & Laughlin Building
Pittsburgh 19, Pennsylvania

Please send me a copy of "*New J&L Electreat Heat-Treated, Cold-Finished Steel*."

Do you recommend Electreat for:

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COMPANY NAME _____
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JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY and JALLOY (hi-tensile steels).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

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A TIP**
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WEIGER-WEED!

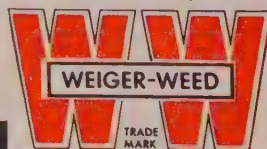
For correct, speedy and dependable welding—long tip life! Also positively leak-proof, water cooled holders.

The very latest improvements in Resistance Welding Tips are embodied in Weiger-Weed fabrication. Here are tips, the product of long specialized engineering, in alloys most efficiently combining required physical and electrical characteristics—with precision machined smoothness of electrode surface—water-tight fit in holders—ample cooling water capacity. Standard replaceable, pointed, dome, flat, offset, all immediately available from stock.

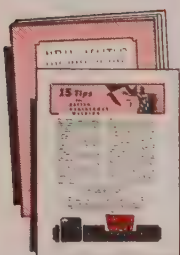
Higher Quality in Water-cooled, Positively Leak-proof Holders

Built to Weiger-Weed standards for greater dependability, performance unsurpassed. Straight, offset, universal and close-coupled types—ejector or non-ejector types, for regular or heavy duty.

It will pay you to talk over your resistance welding problems with your Weiger-Weed representative. Weiger-Weed & Co., Division of Fansteel Metallurgical Corporation, 11644 Cloverdale Avenue, Detroit 4, Michigan.



Resistance Welding ELECTRODES
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DIVISION OF FANSTEEL METALLURGICAL CORPORATION



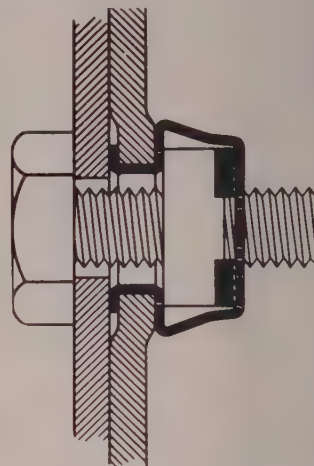
Just off the press! A convenient poster of 15 simplified rules for better welding. Send for it—no charge. Also ask for the Weiger-Weed catalog.

11502-B



Products Inc., 2038 Fulton Rd., Cleveland 13, O. Called a Speed Grip nut retainer, the fastener is easily snapped into place by hand or with a screw driver.

In its manufacture, the one piece grip is clinched to form a loose, cage-like box over a standard, threaded nut. Two sides are open, with two small lips bent over to retain the nut. The speed grip is formed around the other two sides and the ends are



clinched underneath to form two opposing steel spring prongs, one of which, when attached to a sheet metal panel, is inserted into the square hole and the other snapped into place by applying pressure. It may be applied to blind location. The nut floats, compensating for slight misalignment and preventing cross threading.

Check No. 8 on Reply Card for more Details

Electric Furnaces

To permit access to the heating chamber with minimum loss of heat, an upper and lower section division has been made in the heavily insulated door of the Series 1700 Temco electric furnaces, announced by Thermo Electric Mfg. Co., 495 W. Locust St., Dubuque, Iowa. Both door sections are controlled by a single counter-balanced lever. Partial movement of the lever through its arc lowers the lower section while the full movement exposes the full chamber of the furnace.

Features include an all-steel body of welded construction, 6 inches of insulation and heating elements of nickel-chromium alloy. Even distribution of heat is assured by embedding the elements in refractory plates which form the sides, top and bottom of the heating chamber. Plate replacements are made without dismantling the furnace. They are fur-

ished with either a Temcometer temperature controlling and indicating instrument or with an electronic controlling pyrometer. Furnaces may be operated continuously up to 1650°

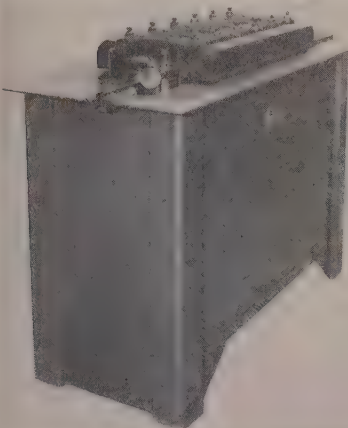


F. Chamber opening is 8½ x 7½ inches and depth may be either 13½ or 18 inches.

Check No. 9 on Reply Card for more Details

Lock Forming Machine

Four sets of lock forming rolls feature the new model 20 lock forming machine introduced by Roy G. Flagler Mfg. Co., 19321 Filer Ave., Detroit 12, Mich. The six stage lock



forming units form Pittsburgh lock, double seam, flat S-cleat, and drive cleat, respectively, in a single pass. Roll stands are progressively geared so that the end roll turns at slightly faster speed than the first or starting roll.

Rolls, gears and shafts are of hardened steel and roll shafts are mounted on Torrington needle bearings. Proper roll tension is assured by a set of Neoprene loaded cylinders. A machine makes the Pittsburgh lock in 20 to 26 gage metal, using approximately 1 inch of material. The ma-



SEE WHAT'S HAPPENED TO WELDING ELECTRODES!

Time was when you had to tackle almost every arc welding job with just one electrode. Now electrode types come by the score.

Nearly 20 years ago M & T started something with its Murex "hot rod" for downhand welding — one of the first electrodes engineered to do a specific job and do it better.

Today M & T is well out in front with the "SELECT 70." Yes, now there are 70 types of electrodes in the M & T line — each one selected from a number of designs to give top performance on a particular class of work — each one picked to help you do the best possible job, more speedily, at lower cost.

You need look no further than M & T's "SELECT 70" for easy selection of the right electrode for any application. Write today for your brief but comprehensive catalog.

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chine is powered by a 110/220 volt, 2/3 horsepower motor, with V-belt drive.

Check No. 10 on Reply Card for more Details

Stacking Truck

Low initial cost of motorized hand trucks is combined with the advantages of rider-type industrial trucks for short-haul duties in the Trans-rider Stacker, announced by Automatic Transportation Co., 149 West 87th St., Chicago, Ill. Because the operator operates the truck from a seated position, he uses less energy and the job will be performed more efficiently. Dimensions of the truck permit operation in crowded quarters, and inside of box cars and trailers.

With a telescopic lift mechanism the stacking truck can lift to 130 inches, despite an overall height of only 83 inches, for clearance through standard factory and box car doors. Single lift is 66 inches before telescopic uprights are extended. Capacity is 2000 pounds with a 48-inch load or 3000 pounds with a 28-inch load. Truck has three speeds forward and three in reverse, being powered by standard Transporter batteries.

Check No. 11 on Reply Card for more Details

Cutoff Machine

Cutting out of sections from plates and closer adjustment of saw guides to work are features of the 18 x 18 inch capacity vertical type cutoff



machine, introduced by Grob Brothers, Grafton, Wis. The frame on which two 18-inch diameter saw wheels are mounted travels on rollers. Cutting cycle is completely automat-

ic. Two graduated scales, one alongside the vise and one at the saw frame where the feed stop is located, show how many inches of cutting is required when material is clamped into the vise. Indicator on the feed stop is then adjusted for this length.

Electrically controlled work feed pressure is adjustable from zero to 100 pounds. This feed has an adjustable hydraulic check control which eases the cutting of sheet metal and thin tubing. The saw blade used is 3/4-inch wide and 162 inches long. A 1 hp motor is used for the five-speed saw blade drive and a separate 1/3-hp motor for the automatic work feed.

Check No. 12 on Reply Card for more Details

Metal Remelter

Nolan Corp., 1333 East Dominick St., Rome, N. Y., is producing a metal remelting furnace for soft metals. Square in design, it is offered in two models, with 1 ton and 650 pound capacity pots. Both are compact units equipped with hinged cover, ventilating pipe connection, bottom draw-off valve with swing spout and heating arrangement.

Furnaces may be equipped for heating by electricity, or any type of gas, as desired. They are regularly fur-

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INDUSTRIAL PLANTS
TO DO THE TOUGHEST
BLASTING AND PEENING
OPERATIONS



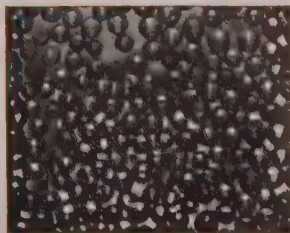
FAMOUS

FOR ITS ABILITY
TO STAND UP
UNDER REPEATED
HARD USE

SHOT GRIT

- ROUND
- UNIFORM IN SIZE
- UNIFORM IN HARDNESS
- LACKS IRREGULAR SHAPES

- RECTANGULAR
- SHARP
- TOUGH
- DURABLE

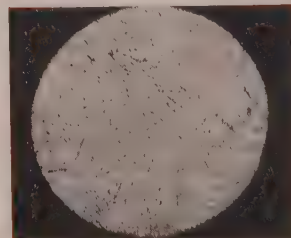


UNRETOUCHED PHOTO OF
HI-GRADE SHOT

CLAYTON-SHERMAN ABRASIVES COMPANY

3896 LONYO ROAD
DETROIT 10, MICHIGAN

CEdar 7200



MICROSCOPIC STRUCTURE
OF METAL

BRAZED AND HARDENED AT THE *Same* TIME



ONE EVERY
20 Seconds!

with **TOCCO*** Induction Heating

Your product may be very different from the Kennametal coal-cutting bit shown here, but if you have to harden, braze, anneal or forge it, TOCCO can probably improve your product, speed your production and cut your costs.

Engineers at Kennametal, Inc., Latrobe, Pa., have hit upon a thrifty production shortcut that saves time and expense and improves their product, too. The mining-machine bit is heated to 1600° F, brazing the carbide insert to the steel shank. The cutter is then quenched, hardening the alloy steel shank to 47-52 R.C. Result: a super-tough cutter that will stand the most rugged production tests with a carbide tip that's on for life.

Besides combining the hardening and brazing operations TOCCO has stepped up production to the rate of one part every 20 seconds—nearly twice the production obtained by former methods—with a consequent reduction of unit costs.

TOCCO engineers are ready to survey your operations to find where TOCCO Induction Heating can help you improve your products, speed your production and reduce your costs.

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Please send copy of "Typical Results of TOCCO Induction Hardening and Brazing".

Name

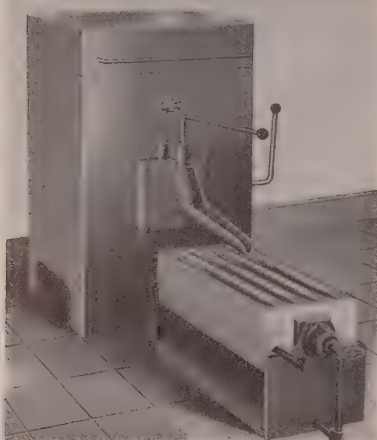
Position

Company

Address

City Zone State

nished for temperatures up to 850° F. Automatic temperature control is an optional feature available. Both models may be supplied without the bottom pouring valve for plants where hand ladling or pump casting



is required. It can also be furnished with larger capacity pots in sizes up to 5 tons.

Check No. 13 on Reply Card for more Details

• • •

HEATERS: Two new unit heaters of improved design, in both horizontal and vertical models, have been added to the line of United States Radiator Corp., Detroit, Mich. They are made for either steam or hot water heating systems.

Check No. 14 on Reply Card for more Details

GENERATORS: Two new models of Ultrasonic generators are offered by Central Scientific Co., Chicago, Ill. U-300 Ultrason crystal delivers 300 watts of sound energy to the oil bath. Model 100 Ultrason delivers a maximum of 6 watts at the crystal. Both units operate at 450 kilocycles.

Check No. 15 on Reply Card for more Details

ABRASIVE PAINT: Sure-Foot is a new type of nonslip abrasive paint for application to industrial or public floors and surfaces where slippery conditions prevail. May be applied by brush or trowel. It is made by Frost Paint & Oil Corp., Minneapolis 13, Minn.

Check No. 16 on Reply Card for more Details

HEATER: A self-contained, gas-fired revolving unit heater is announced by L. J. Wing Mfg. Co., New York, N. Y. Using either natural or manufactured gas, it combines gas burners, heat exchanger and combustion chamber with a motor driven Wingfoil

fan and Wing revolving discharge outlets. In the summer it can be used as a cooling device by turning off gas and turning on the fans.

Check No. 17 on Reply Card for more Details

AIR VALVE: The general purpose air hose valve and nozzle introduced by Paul Valve Corp., New York 17, N. Y., has no springs, no packing and requires little thumb pressure to open and instantly snaps tightly shut when actuating plunger is released. It is for any air line up to 100 pounds per square inch pressure.

Check No. 18 on Reply Card for more Details

WORK BENCH: A new all steel work bench with hopper for use in foundries and ceramic industries is introduced by Chicago Mfg. & Distributing Co., Chicago 9, Ill. Made of 10 gage steel, working surface of bench is 36 inches above the floor and 16 inches deep.

Check No. 19 on Reply Card for more Details

CORRUGATED BOX: Corrugated boxes for use with revolving head fork truck are manufactured by Palmer-Shile Co., Detroit 27, Mich. Square corners give more interior box space. Boxes are made to customer specifications.

Check No. 20 on Reply Card for more Details

HANGERS: Thompson Electric Co., Cleveland 14, O., announces series No. 170 and No. 180 one-piece deep canopy disconnecting and lowering hangers which have been designed for outdoor lighting applications.

Check No. 21 on Reply Card for more Details

CONTROL: Photoswitch Inc., Cambridge 42, Mass., introduced type 20DJI photoelectric control for general industrial and machinery applications. It provides automatic control and is particularly efficient in counting, conveyor control, short-range signal systems, motor or valve control and similar processes.

Check No. 22 on Reply Card for more Details

DIAMOND DISK WHEEL: KE Industries, Minneapolis, Minn. offers a diamond disk wheel made by a low temperature bonding process that avoids injury to diamond particles and gives immediate fast cutting action.

Check No. 23 on Reply Card for more Details

REMOTE CONTROL SYSTEM: Although developed for remote control of lighting and appliance circuits, the new low voltage control system made by Square D. Co., Detroit 11,

Mich., has many other applications in industry. Individual relays are controlled by any number of conveniently located switches operating on a 24 volt system.

Check No. 24 on Reply Card for more Details

BORING, FACING TOOLS: Three sizes of E-Z Set tools, models No. 40, No. 41 and No. 42 which have cutter block travel of $\frac{3}{4}$, 1 $\frac{1}{2}$ and 2 $\frac{1}{4}$ inches, are available from Maxwell Co., Bedford, O. Boring capacities range from $\frac{3}{8}$ to 20 inches and are made possible by the three-position feature in each head for positioning of boring bar.

Check No. 25 on Reply Card for more Details

CLUTCH: Steelgrip, a new spring clutch offered by L.G.S. Spring Clutch Corp., Indianapolis, Ind., is designed to meet the demand for an externally operated clutch of high capacity, principally for gasoline engine and electric motor drive.

Check No. 26 on Reply Card for more Details

FILING CABINET: Draw-In-Dex cabinet, made by Empire Development Corp., Washington, D. C., accommodates up to 1000 blueprints or drawings, any of which can be removed or replaced without disturbing the others. Suspension rods on hinges hold drawings. Cabinet measures 20 x 30 inches and is 4 feet high.

Check No. 27 on Reply Card for more Details

SILVER ALLOY: Eutecrod 1700 for stainless steel, copper, brass, bronze, tungsten carbide and steel, available from Eutectic Welding Alloys Corp., New York 13, N. Y., is a high silver alloy that is recommended for making lap, square, butt and T joints and for sealing and filling small cracks and defects.

Check No. 28 on Reply Card for more Details

EXTINGUISHER: A dry chemical powder extinguisher designed for use against flammable liquid and electrical fires in industrial plants and similar places is offered by Walter Kidde & Co., New York 16, N. Y. It is available in 20 and 30-pound capacities.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment
in this section, fill in a card.
It will receive prompt attention;

Market Summary

REDUCED activity of some fabricators and increasing caution over inventories are continuing to remove some of the pressure from steel demand. However, overall requirements remain in excess of supply, even though ingot production has been at or near 100 per cent of capacity for some time.

The supply situation is one of contrasts. While some consumers must limit their operations to their steel supply, others have an excess of steel. However, the latter find no difficulty in disposing of it. Even though current operations do not require all the steel some fabricators are receiving, cancellations of mill orders are few, for consumers generally still regard steel supplies as "money in the bank."

DISTRIBUTION—Although mills foresee no immediate possibility of dispensing with their quota systems of distributing steel, there is a disposition of some producers, who had withdrawn completely or to a great extent from some districts because of freight disadvantages, to sound out old customers as to future needs. Although little tonnage has thus far been reinstated by mills, there is a definite inclination to do a little "fence building." Some consumers see in this action not only an easing in the outlook for steel but also a tendency on the part of producers to strengthen position with old customers on the chance of government approval of modification in the mill pricing system.

PRICES—With a growing pressure for lower production costs and with some of the urgency off demand for steel, fabricators are showing increasing resistance to premium priced tonnage, such as obtained through conversion deals, the gray market, and warehouses, and are placing more dependence on mills for supplies. In a few instances resistance to high prices extends even to the regular-price steel market.

Indicative of the evaporation of demand in the premium price field is a cut last week of a Texas producer's foundry pig iron price from

\$75 a ton to \$50.50. Two producers of silicon sheet and strip, and a wire producer, reduced their prices into line with other makers. A steel broker is offering 2600 tons of cold and hot-rolled sheet in wanted sizes and gages and a sizable tonnage of enameling sheet at 8¼c a pound.

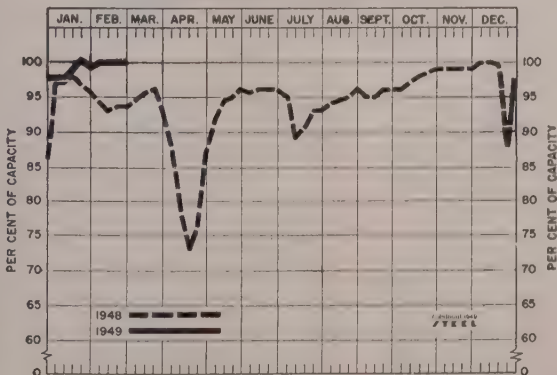
PRICE COMPOSITES—With only few and minor adjustments in prices in the regular steel market, STEEL's arithmetical price composite on finished steel remained unchanged at \$97.77 last week, compared with \$81.14 in the corresponding period a year ago, and semifinished steel held at \$75.75, compared with \$68.72 in the like week last year.

PRODUCTION—February was the fourth recent month in which steelmaking operations were at or above capacity, the others being October, November, and January. Because of the shorter month, however, February's output will not equal January's all-time high of 8,172,236 net tons.

PIG IRON—Although business has been dull for foundries, their demands for pig iron have been well sustained as they strive to raise the proportion of iron in their melts to more normal and desirable levels. However, some easing is noted in the demand for iron and some sellers are offering tonnage more freely than for some time. STEEL's arithmetical price composite on steelmaking pig iron continued unchanged last week at \$46.22, compared with \$39.38 in the corresponding week a year ago.

SCRAP—Futher weakness developed in the scrap market last week and No. 1 heavy melting dropped \$2 a ton in one area. As a result, STEEL's arithmetical price composite on steelmaking scrap dropped last week to \$37.50 from the preceding week's \$38.17. Steel producers and foundries have largely been staying out of the market for the last two months, and there is considerable speculation as to whether the former will return early in March.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts				
	Week Ended Feb. 26	Change	Same Week 1948	Same Week 1947
Pittsburgh	97	- 2.5*	93	93
Chicago	99.5	+ 1*	92	92
Eastern Pa.	97	None	91	88
Youngstown	105	None	102	89
Wheeling	92.5	None	90	93.5
Cleveland	100.5	None	95	90.5
Buffalo	104	None	86	90.5
Birmingham	100	None	100	99
New England	88	- 1	85	92
Cincinnati	103	None	90	87
St. Louis	89.5	None	77.5	74.5
Detroit	104	- 2	90	87
Estimated national rate	100	None	93.5	92.5

* Revised.

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Month Feb. 26 1949	Month Feb. 19 1949	Month Jan. 1949	Year Feb. 1949	5 Years Feb. 1944
Finished Steel	\$97.77	\$97.77	\$97.75	\$79.86	\$56.73
Semifinished Steel	75.75	75.75	75.75	67.16	36.00
Steelmaking Pig Iron	46.22	46.22	46.26	39.30	23.00
Steelmaking Scrap	37.50	38.17	41.54	40.48	19.17

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods, on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. January, 1949, figure is preliminary.

FINISHED STEEL WEIGHTED COMPOSITE†	
Jan. 1949.....	4.20563c
Dec. 1948.....	4.14190c
Nov. 1948.....	4.11778c
Jan. 1948.....	3.49997c
Jan. 1944.....	2.41455c

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Feb. 26, 1949	Jan. 1949	Nov. 1948	Feb. 1948
Steel bars, Pittsburgh mills.....	3.45c	3.45c	3.45c	2.90c
Steel bars, del. Philadelphia.....	3.8164	3.8094	3.79	3.356
Steel bars, Chicago mills.....	3.35	3.35	3.35	2.90
Shapes, Pittsburgh mills.....	3.275	3.275	3.275	2.80
Shapes, Chicago mills.....	3.25	3.25	3.25	2.90
Shapes, del. Philadelphia.....	3.4918	3.4888	3.48	2.968
Plates, Pittsburgh mills.....	3.50	3.50	3.50	2.95
Plates, Chicago mills.....	3.40	3.40	3.40	2.95
Plates, del. Philadelphia.....	3.7256	3.7217	3.71	3.19
Sheets, hot-rolled, Pittsburgh mills.....	3.275	3.275	3.275	2.80
Sheets, cold-rolled, Pittsburgh.....	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Pittsburgh.....	4.40	4.40	4.40	3.95
Sheets, hot-rolled, Gary mills.....	3.25	3.25	3.25	2.80
Sheets, cold-rolled, Gary mills.....	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Gary mills.....	4.40	4.40	4.40	3.95
Strip, hot-rolled, Pittsburgh mills.....	3.275	3.275	3.275	2.925
Strip, cold-rolled, Pittsburgh mills.....	4.375	4.375	4.375	3.675
Bright basic, wire, Pittsburgh.....	4.325	4.325	4.325	3.775
Wire nails, Pittsburgh mills.....	5.775	5.775	5.775	4.95
Tin plate, per base box, Pitts. dist.	\$6.70	\$6.80	\$6.80	\$6.70

Semifinished

Sheet bars, mill.....	\$67.00*	\$67.00*	\$67.00*	\$56.79
Slabs, Chicago.....	52.00	52.00	52.00	42.59
Re-rolling billets.....	59.00	59.00	59.00	42.59
Wire rod 1/2 to 1/4-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.175c

* Nominal.

Pig Iron

	Feb. 26, 1949	Jan. 1949	Nov. 1948	Feb. 1948
Bessemer, del. Pittsburgh (N.&S. sides).....	\$48.08	\$48.08	\$48.08	\$40.986
Basic, Valley.....	46.00	46.00	46.00	39.00
Basic, eastern del. Philadelphia.....	50.3002	50.2676	50.17	42.004
No. 2 fdy., del. Pgh. (N.&S. sides).....	47.58	47.58	47.58	40.496
No. 2 fdy., del. Philadelphia.....	50.8002	50.7676	50.67	42.504
No. 2 foundry, Chicago.....	46.25	46.25	46.25	39.00
No. 2 foundry, Valley.....	46.50	46.50	46.50	39.50
Southern No. 2 Birmingham.....	43.38	43.38	43.38	37.88
Southern No. 2 del. Cincinnati.....	49.43	49.35	49.09	40.74
Malleable, Valley.....	46.50	46.50	46.50	39.50
Malleable, Chicago.....	46.50	46.50	46.50	39.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	55.00
Ferromanganese, f.o.b. Etna, Pa. ..	163.00	163.00	163.00	151.00

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt, steel, No. 1, Pittsburgh.....	\$39.00	\$41.90	\$42.75	\$40.44
Heavy melt, steel, No. 2, E. Pa. ..	35.00	40.00	41.50	39.125
Heavy melt, steel, No. 1, Chicago.....	34.00	39.38	41.75	39.125
Heavy melt, steel, No. 1 Valley.....	37.75	39.75	42.75	40.25
Heavy melt, steel, No. 1, Cleveland.....	37.25	39.25	42.25	39.75
Heavy melt, steel, No. 1, Buffalo.....	40.50	45.88	48.50	43.63
Rails for re-rolling, Chicago.....	45.75	59.38	69.50	51.00
No. 1 cast, Chicago.....	41.50	58.38	70.50	66.00

Coke

Connellsville, beehive furnace.....	\$14.50	\$14.50	\$14.50	\$12.50
Connellsville, beehive foundry.....	17.00	17.00	17.00	14.78
Chicago, oven foundry, ovens.....	20.40	20.40	20.40	18.00

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Re-rolling quality, standard analysis, open market, \$100-\$105 per gross ton. Forging quality, \$50 per net ton, mill.

Alloy Steel Ingots: \$51 per net ton, mill.

Re-rolling Billets, Blooms, Slabs: \$52 per net ton, mill, except: \$62, Conshohocken, Pa.; \$66, Monessen, Pa.; sales by smaller interests on negotiated basis at \$85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: \$61 per net ton, mill, except: \$68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Re-rolling quality, \$63 per net ton, mill except: \$70, Conshohocken, Pa.

Sheet Bars: \$67 nom., per net ton, mill; sales in open market \$110-\$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: \$76 per net ton, mill; some sellers quoting up to \$120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & 1/2-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburgh, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c Monessen, Pa. Basic open-hearth and bessemer, not re-sulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Alliquippa, Pa.; 4.05c, Pittsburgh, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 4.40c, Atlanta; 5.30c, Fontana, Calif.

Rail Steel Bars (Base 10 tons): 3.35c, Moline, Ill.; 5.10c, Williamsport, Pa.; another interest quotes 5.35c, mill.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.00c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J.; Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.50c, Camden, N. J.; 5.30c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.80c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford.

High-Strength, Low-Alloy Bars: 5.10c, mill, except 5.30c, Youngstown; 5.40c, Ecorse, Mich. **Reinforcing Bars (New Billet):** 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburgh, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; another interest quotes 5.35c, mill.

Wrought Iron Bars: Single Refined: 8.60c (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburgh, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O.; 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich.; 4.70c, Granite City, Ill.; 4.95c, Pittsburgh, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburgh, Torrance, Calif.; 5.30c, Kokomo, Ind.

Galvanized Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Plate (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburgh, Torrance, Calif.

Long Terns, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mill. **Armature:** 5.45c, mill, except: 5.95c, Warren, O.; 6.05c, Niles, O.

Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.; 6.55c, Niles, O.

Motor: 6.70c mill except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill, except: 9.15c, Follansbee, W. Va., Toronto, O.; 10.05c, Brackenridge, Pa.; 65, 8.60c, mill, except: 9.85c, Follansbee, W. Va., Toronto, O.; 10.60c, Brackenridge, Pa.; 58, 9.30c, mill, except: 10.55c, Follansbee, W. Va., Toronto, O.; 11.30c, Brackenridge, Pa.; 52, 10.10c, mill, except: 11.35c, Follansbee, W. Va., Toronto, O.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills.

Galvanized (No. 10): 6.75c, mill.

Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 8.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Atlanta; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburgh, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa, Colo.; 5.90c Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

* Wider than 6-in. and 6-in. and narrower respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn.; West Leechburg, New Castle, Pa.; Boston; 4.75c, Dover, O.; New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, New Castle, Pa.; Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating \$7.50-\$7.70; 1.50 lb coating \$7.75-7.95. Pittsburgh, Calif., mill \$8.25 and \$8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, \$6.45-6.65; 0.50 lb tin, \$6.70-\$6.90; 0.75 lb tin, \$7.00-\$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight \$5.75-\$5.85. Pittsburgh, Calif., mill, \$6.50.

Hollowware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, \$6.65, except: \$6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, \$15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.50c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.50c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Heath Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif. Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Youngstown.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa.; Minnequa, Colo.; Atlanta, Buffalo, 4.70c; Portsmouth, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburgh, Calif.; 5.15c, S. San Francisco; 5.40c, Shelton, Conn. One producer

quotes 4.15c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburgh, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburgh, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md.; 4.95c, Monessen, Pa.; 5.10c, Worcester, Mass.; 5.15c, Minnequa, Colo.; Kokomo, Ind.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburgh, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; 5.40c, Aliquippa, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburgh, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109, Worcester, Mass.; 110, Minnequa, Colo., Atlanta; 117, Portsmouth, O.; 123, Pittsburgh, Calif.; 124, Cleveland; 126, Monessen, Pa.; \$6.75c per 100 pound keg, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 103, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except: 113, Monessen, Pa., Kokomo, Ind.; 116, Minnequa, Colo.; 121, Atlanta; 132, Pittsburgh, Calif. One producer quotes column 109, Pittsburgh and Chicago base; another column 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Column 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126, Atlanta; 128, Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburgh, Calif.; 145, S. San Francisco. One producer quotes 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Column 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; \$123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburgh, Calif. One producer quotes col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Shaps	Strip, Cold-Rolled	Sheets
301.....	28.50-28.75	30.50-32.00	37.50-40.75
302.....	28.50-28.75	33.00-33.75	37.50-40.75
303.....	31.00-31.50	36.50-39.75	39.50-43.00
304.....	30.00-31.25	35.00-35.75	39.50-43.00
316.....	46.00-48.00	55.00-57.25	53.00-57.25
321.....	34.00-34.75	44.50-45.75	45.50-49.00
347.....	38.50-39.75	48.50-50.25	50.00-54.00

STRAIGHT CHROMIUM STEELS

410.....	22.75-23.00	26.50-27.00	32.00-33.00
416.....	23.25-23.50	28.25-33.50	32.50-33.50
430.....	23.25-23.50	27.00-27.50	34.75-35.50
446.....	32.50-33.00	60.00-62.25	46.50-50.00

STAINLESS-CLAD STEELS

Type	Plates		Sheets	
	—Cladding—	10% 20%	—Cladding—	10% 20%
302.....	22.50	26.50	19.75	21.50
304.....	22.50	26.50	20.75	22.50
310.....	27.00	31.00	26.00	28.00
316.....	23.50	27.50	24.00	26.00
347.....	25.00	29.00	24.00	26.00
405.....	18.75	24.75	18.75	24.75
410.....	18.25	24.25	18.25	24.25
430.....	18.25	24.25	18.25	24.25

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	85.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about \$200 a net ton.

In.	Bk.	Gal.	Butt Weld In.	Bk.	Gal.
1/2.....	39 1/2	8 1/2	1.....	40	25
3/4.....	41 1/2	12 1/2	1 1/2.....	48 1/2	27 1/2
1.....	37 1/2	9 1/2	1 3/4.....	46 1/2	25 1/2
1 1/4.....	39 1/2	14	2.....	49	28
1 3/4.....	34	4 1/2	2 1/4.....	47	26 1/2
2.....	36	9	2 3/4.....	49 1/2	28 1/2
2 1/2.....	43	21 1/2	3.....	50	29
3.....	43 1/2	22	3 1/2.....	48 1/2	27 1/2
3 1/2.....	46	24 1/2	3 3/4.....	50 1/2	29 1/2
			4.....	44 1/2	22 1/2

In.	Bk.	Gal.	Elec. Weld In.	Bk.	Gal.
2.....	39 1/2	17 1/2	38 1/2	16 1/2	5
2 1/2.....	42 1/2	20 1/2	41 1/2	19 1/2	10 1/2
3.....	43 1/2	21 1/2	41 1/2	19 1/2	13
3 1/2.....	43 1/2	21 1/2	41 1/2	19 1/2	20
3 3/4.....	42 1/2	20 1/2	43 1/2	21 1/2	16 1/2
4.....	46 1/2	24 1/2	43 1/2	21 1/2	18 1/2
5 & 6	42 1/2	20 1/2	43 1/2	21 1/2	36 1/2
	44 1/2	22 1/2	43 1/2	21 1/2	22
7.....			43 1/2	20 1/2	

Line Steel Pipe: Mill prices in carlots to consumers about \$200 a net ton.

In.	Bk.	Gal.	Butt Weld In.	Bk.	Gal.
1/2.....	40 1/2	...	1 1/4.....	46	26
3/4.....	38 1/2	...	1 1/2.....	48	27
1.....	35	...	1 3/4.....	46 1/2	25 1/2
1 1/4.....	40	18 1/2	2.....	48 1/2	27 1/2
1 1/2.....	42	19 1/2	2 1/4.....	47	26 1/2
1 3/4.....	43	22 1/2	2 1/2 & 3	49 1/2	28 1/2
2.....	45 1/2	25 1/2	3 1/2 & 4	43 1/2	...
	47 1/2	26 1/2	3 3/4 & 4	43 1/2	...
In.	Bk.	Gal.	Elec. Weld In.	Bk.	Gal.
2.....	38 1/2	16 1/2	37 1/2	16 1/2	4
2 1/2.....	42 1/2	20 1/2	40 1/2	19 1/2	37 1/2
3.....	42 1/2	20 1/2	40 1/2	19 1/2	34
			40 1/2	19	12
3 1/2.....	41 1/2	20	42 1/2	20 1/2	37 1/2
	45 1/2	23 1/2	42 1/2	20 1/2	21
5 & 6	41 1/2	20	42 1/2	20 1/2	37 1/2
	43 1/2	...	42 1/2	20 1/2	21
8.....	45 1/2	...	44 1/2	21 1/2	40 1/2
			22	44 1/2	22
10.....	45	...	44	21	41 1/2
			21 1/2	44	21 1/2
12.....	44	...	43	20	40 1/2
			43	20 1/2	...

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about \$200 a net ton.

In.	Bk.	Gal.	Butt Weld In.	Bk.	Gal.
1/2.....	59 1/2	95 1/2	1 1/4.....	22	53
3/4.....	20 1/2	52 1/2	1 1/2.....	15 1/2	45 1/2
1.....	10 1/2	41 1/2	2.....	7 1/2	36 1/2
1 and 1 1/4	4 1/2	32 1/2	2 1/2 & 3	5	32
1 1/2.....	1 1/2	29	4.....	List	26
2.....	—	28 1/2	4 1/2 & 8	2	27 1/2
			9-12	12	37

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 ft., inclusive.

In.	B.W.	H.R.	Seamless—C.D.	Elec. Weld H.R.	C.D.
1	13	.....	13.39-14.64	13.00	13.00
1 1/4	13	.....	15.87-17.34	13.21	15.39
1 1/2	13	16.45	17.71-19.35	14.60	17.18
1 3/4	13	18.71	20.15-22.02	16.60	19.54
2	13	20.96	22.56-24.66	18.60	21.89
2 1/4	13	23.36	25.16-27.50	20.73	24.40
2 1/2	12	23.54-25.73	27.70-30.28	22.83	26.88
2 3/4	12	25.79-29.19	30.33-33.15	25.02	29.41
3	12	27.38-29.87	32.14-35.13	26.51	31.18
3 1/2	12	28.68-31.35	33.76-36.90	27.82	32.74
4	11	33.39-36.50	36.42-42.95	32.39	38.11
4 1/2	11	35.85-39.19	42.20-46.13	35.79	40.94
4 3/4	10	44.51-48.65	52.35-57.22	43.17	50.78
5	9	58.99-64.47	69.42-75.88	...	...
5 1/2	9	68.28-74.64	80.35-87.82	...	...
6	7	104.82-114.57	123.33-134.81	...	...

Pipe, Cast Iron: Class B, 6-in. and over, \$98.50 per net ton, Birmingham; \$106.70, del. Chicago; 4-in. pipe, \$5 higher; Class A pipe, \$5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; \$3.20-per 100 lb mill, except: \$3.50, Indiana Harbor, Ind., and Minnequa, Colo.

Light (billet): \$3.55 per 100 lb, mill, except: \$4.25, Minnequa, Colo.

Light (rail steel): \$5.10 per 100 lb, Williamsport, Pa.

Railroad Supplies: Track bolts, treated: \$3.50 per 100 lb, mill. Untreated: \$3.25, mill.

Flat Plates: 4.05c mill, except: 4.20c, Pittsburgh, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill, except: 5.25c, Pittsburgh.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per gross ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	\$48.00	\$48.50	\$49.00	\$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del. ....	...	52.634	53.134	...
Philadelphia, del.	50.3002	50.8002	51.3002	51.8002
Birmingham, furnace	42.88	43.38	...	...
Cincinnati, del. ....	...	49.43	...	...
Buffalo, furnace	47.00	47.00	47.50	48.00
Boston, del.	56.20	56.20	56.70	...
Rochester, del.	49.35	49.35	49.85	50.35
Syracuse, del.	50.2065	50.2065	50.7065	41.2065
Chicago, district furnaces ..	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del. ....	...	51.28-51.78	51.78	...
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Lone Star, Tex., furnace	50.00	50.50	...	...
Duluth, furnace ....	...	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace ....	...	52.75	53.25	...
Geneva, Utah, furnace	46.00	46.50	...	...
Seattle, Tacoma, Wash., del. ....	...	54.0578	...	...
Portland, Oreg., del. ....	...	54.0578	...	...
Los Angeles, San Francisco	53.5578	54.0578	...	...
Granite City, Ill., furnace ...	47.90	48.40	48.90	...
St. Louis, del.	49.40	49.90	50.40	...
Ironton, Utah, furnace	55.00	55.50	...	...
Neville Island, Pa., furnace ..	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	...	...	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	46.00	...	...	...
Swedeland, Pa., furnace	50.00	50.50	51.00	...
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	...	...
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

† Low phosphorus southern grade.

‡ To Neville Island base add: \$0.86 for McKees Rocks, Pa.; \$1.31 Lawrenceville, Homestead, McKeesport, Monaca; \$1.73 Verona; \$1.94 Brackenridge; \$1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base) ..	\$59.50
6.51-7.00 ..	60.75
7.01-7.50 ..	62.00
7.51-8.00 ..	63.25
8.01-8.50 ..	64.50
8.51-9.00 ..	65.75
F.o.b. Jackson, O., per gross ton	11.01-11.50
Buffalo furnace \$1.25 higher.	72.00

Intermediate phosphorus, Central furnace, Cleveland, \$51.

Electrodes

(Threaded, with nipples, unboxed)

Inches Length Cents per lb. f.o.b. plant

Diam.	Length	Cents per lb. f.o.b. plant
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
4, 5 1/2	48, 60	19.00
3	40	19.50
2 1/2	24, 30	20.50
2	24, 30	21.00
	(Carbon)	
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content, 70% or more, \$37; less than 60%, \$34.

Low Phosphorus

Steelton, Pa., \$54; Buffalo, Troy, N. Y., \$50; Philadelphia, \$56.9786 delivered.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace ..	\$13.50-15.50
Connellsville, foundry ..	16.00-18.00
New River, foundry ...	16.50
Wise county, foundry ..	15.35
Wise county, furnace ..	14.60
Oven Foundry Coke	
Kearney, N. J.,ovens ..	\$22.00
Everett, Mass.,ovens ..	20.85
New England, del.† ..	23.35
Chicago,ovens ..	20.40
Chicago, del.	21.85
Detroit, del.	24.16
Terre Haute,ovens ..	21.00
Milwaukee,ovens ..	21.15
Indianapolis,ovens ..	21.05
Chicago, del.	24.19
Cincinnati, del.	23.66
Detroit, del.	24.61
Ironton, O.,ovens ..	19.40
Cincinnati, del.	21.63
Painesville, O.,ovens ..	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham,ovens ..	17.70
Philadelphia,ovens ..	21.05
Swedeland, O.,ovens ..	21.00
Portsmouth, O.,ovens ..	19.50
Detroit,ovens ..	20.65
Detroit, del.	*21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, \$1.05; †, \$1.45. ‡ Or within \$4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon,ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees	23.00-26.50
Industrial xylol	20.50-26.50

Per ton bulk,ovens Sulphate of ammonia

Per pound,ovens (Effective as of Oct. 1)

Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots ..	14.25
Do., tank cars	12.50

(Effective as of Oct. 25)

Naphthalene flakes, balls, bbl to jobbers, "household use"

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalla, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., \$100. Hardened, \$185 at above points.

High-heat Duty: Salina, Pa., \$85; Woodbridge, N. J., St. Louis, Farber, Vandalla, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchens, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., \$80.

Intermediate-Heat Duty: St. Louis, or Vandalla, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchens, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., \$74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., \$66.

Ladle Brick

Dry Press: \$55, Freeport, Merrill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: \$53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., \$90; Beach Creek, Pa., \$80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., \$80; Hays, Pa., \$85; Joliet or Rockdale, Ill., E.

Chicago, Ind., \$89; Lehl, Utah, Los Angeles, \$95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, \$80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., \$81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, \$66; chemical-bonded chrome brick, \$69; magnesite brick, \$91; chemical-bonded magnesite, \$80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, 3/4" grains; Bulk, \$30.50-31.00; single paper bags, \$35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibbonsburg, Woodville, O., \$12.25; Thornton, McCook, Ill., \$12.35; Dolly Siding, Bonne Terre, Mo., \$12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51 1/2% (natural)

Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	\$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa. Foundry and basic 56.62% concentrates, contract

Foreign Ore

Cents per unit, c.i.f. Atlantic ports Swedish basic, 60 to 68% .. 15.00 Brazil iron ore, 68-69% 19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid

Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash.

(S 8 paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	\$37.50
48% 3:1	39.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	\$25.50-26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50

Brazilian—nominal

44% 2.5:1 lump..... \$33.65

Rhodesian

45% no ratio	\$27-\$27.50
48% no ratio	30.00
48% 3:1 lump	39.00

Domestic (seller's nearest rail)

48% 3:1

Molybdenum

Sulphide conc., lb. Mo., cont., Mines

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS			PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	H-R 10 Ga.	C-R 17 Ga.	H-R Rds. 3/8" to 3"	C-F Rds. 1/2" & up	H-R Alloy **4140	Standard Structural Shapes	Floor 3/4" & Thicker
New York (city)	5.80	6.76	7.91	5.92	...	5.80	6.61	8.68	5.53	7.51
New York (c'try)	5.60	6.56	7.71	5.72	...	5.60	6.41	8.48	5.33	7.31
Boston (city) ..	6.10	6.70	8.00	6.10	...	5.67	6.42	8.72	5.57	7.40
Boston (c'try) ..	5.95	6.55	7.85	5.95	...	5.52	6.27	8.57	5.42	7.25
Phila. (city)...	5.72	6.64	7.53-7.58	5.60	...	5.55	6.34	8.40	5.25	6.74
Phila. (c'try)...	5.57	6.59	7.38-7.43	5.45	...	5.40	6.19	8.25	5.10	6.59
Balt. (city) ...	5.46†	6.36	7.26	5.52	...	5.57	6.31	...	5.51	7.16
Balt. (c'try)...	5.31†	6.21	7.11	5.37	...	5.42	6.16	...	5.36	7.01
Norfolk, Va. ..	5.80	...	...	...	...	6.05	7.05	...	6.05	7.55
Wash. (w'hse) .5.84-6.00	...	...	...	5.90	...	5.91-5.95	6.61	...	5.85-5.89	6.05-6.09
Buffalo (del.)..	5.00	5.90	7.85	5.49	6.50	5.20	6.05	10.13	5.25	7.06
Buffalo (w'hse)	4.85	5.75	7.70	5.34	6.35	5.05	5.90	9.98	5.10	6.91
Pitts. (w'hse) .4.85-5.00§	5.75-5.85§	7.15	5.00-5.10	5.95-6.00	4.90-5.10	5.65	9.60	4.90-5.15	5.05-5.25	6.55
Detroit (w'hse).4.85-5.00§	5.75-5.85§	7.15	5.00-5.35	5.95-6.00	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)5.13-5.90††	5.90-6.31	7.35-8.10††	5.18-5.31	6.60-6.85	5.32-5.36	6.05-6.12	8.24-8.56	5.35-5.62	5.52-5.56	6.95-7.01
Cleve. (w'hse).4.98-5.75	5.75-6.16	7.20-7.95	5.03-5.16	6.70	5.17-5.21	5.90-5.97	8.24-8.41	5.21-5.47	5.37-5.41	6.80-6.86
Cincin. (w'hse) .	5.29	6.14	7.63*	5.55	6.10	5.55	6.10	...	5.40	6.94
Chicago (city) .	5.20	5.90†§	7.30	5.00	6.67-6.80	5.05	5.85	8.25*	5.05	6.70
Chicago (w'hse) 4.85-5.05	5.75†§	7.15	4.85	6.52-6.65	4.90	5.70	8.10*	4.90	5.10	6.55
Milwaukee(city)	5.38	6.08†§	7.48	5.18	6.82-6.98	5.23	6.03	8.43*	5.23	6.88
St. Louis (del.)	5.34§	6.24§	7.44	5.34	6.64	5.39	6.19†‡	6.64	5.39	7.04
St. L. (w'hse) .	5.19§	6.09§	7.29	5.19	6.49	5.24	6.04†‡	9.49	5.24	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66-6.83	...	5.15	7.41-7.73*
Birm'ham(c'try)	5.05§	...	6.45	5.05	...	5.00	6.51-6.68	...	5.00	7.26-7.68*
Omaha, Nebr...	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	7.77
Los Ang. (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	8.15
L. A. (w'hse) .	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	8.00
San Francisco .	5.95‡†	7.15	8.05	6.75‡†	8.25‡†	5.90‡†	7.55	10.20†‡	5.90	8.10
Seattle-Tacoma.	6.35‡†	7.90*	8.40	6.70‡†	...	6.20‡†	8.15‡	9.45‡	6.30‡†	8.40‡†

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; 1—1500 lb and over; 2—1000 to 4999 lb; 3—450 to 39,999 lb; 4—three to 24 bundles; 5—450 to 1499 lb; 6—400 to 14,999 lb; 7—400 to 1499 lb; 8—1000 to 1999 lb; 9—1000 to 39,999 lb; 10—1000 lb and over; 11—2000 lb and over; 12—300 to 999 lb; 13—1500 to 1999 lb; 14—1500 to 39,999 lb; 15—400 to 3999 lb; 16—400 lb and over; 17—500 to 1499 lb; 18—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; †‡ top level of quoted range is nominal.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

1/2-in. and smaller; up to 6 in. in length	35 off
3/4-in. and 5/8 x 6-in. and shorter	37 off
3/4-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	30 off

Stove Bolts

In packages, nuts separate, 58 1/2-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

	A.S. f.o.b.	A.S. Reg.	Heavy
Semifinished hexagon	...	...	...
1/2-in. and smaller	41 off	...	...
3/4-in. and smaller	39 off	...	...
1/2-in.-1-in.	37 off	...	...
1 1/4-in.-1 1/2-in.	37 off	...	...
1 1/2-in. and larger	34 off	...	...
Additional discount of 15 for full containers.			

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	...
1/2 and smaller x 6 and shorter	40 off
3/4, 1/2, and 1 x 6-in. and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, 1/4-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural 1/2-in. and larger	6.75c
3/4-in. and under	4.80 off

Washers, Wrought

F.o.b. shipping point, to jobbers. Net to \$1 off

FERROALLOY PRODUCT PRICES

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, \$62, Palmerton, Pa.; \$66, Pittsburgh and Chicago; (16% to 19% Mn) \$1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk, \$160 per gross ton of alloy, c.i.l., packed, \$172; gross ton lots, packed, \$187; less gross ton lots, packed, \$204; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: \$165, Rockwood, Tenn.; \$162, f.o.b. Birmingham and Johnstown, Pa., furnaces; \$160, Sheridan, Pa.; \$163, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add \$31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Ore. Shipment from Chicago warehouse, ton lots, \$201; less gross ton lots, \$218 f.o.b. Chicago. Add or subtract \$2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. Special Grade: (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of material, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound. F.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.i.l., lump, bulk 20.5c per lb of contained Cr, c.i.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.i.l., 8MxD, bulk 22.0c per lb of contained Cr, c.i.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, \$1.03 per lb of contained chromium, ton lot \$1.05, less ton \$1.07. Delivered. Spot, add 5c.

(Please turn to Page 150)

Metal Price Tone Remains Firm

Producers dispose of current production readily despite curtailed use in some industries. Attention now centered in developments on labor front

New York — Labor developments predominated in nonferrous metal markets last week. Howard I. Young, president, American Zinc, Lead & Smelting Co., urged the Senate Committee on Labor and Public Welfare to retain and strengthen the anti-Communist affidavit provision of the present law. He also suggested that these provisions be applied to employers. Mr. Young urged that the law continue to exclude supervisors from the definition of employees; that the bargaining-in-good-faith provision be retained; that the prosecuting and judicial functions of NLRB be maintained; and retention of the independent status of the Conciliation and Mediation Service.

Delegates from United Mine, Mill & Smelter Workers locals in eastern states, meeting in Ansonia, Conn., voted in favor of "a substantial wage increase." Details of completing the demand for a fourth-round wage increase were left to the national wage and policy committee slated to meet in Denver Mar. 13. The delegates also favor a financial pension plan and a health and welfare program.

As a background to these developments, three plants of Mr. Young's company are still strikebound by a six-months old strike, while in Connecticut more than 47,000 workers are unemployed, the largest figure since the postwar reconversion period. Leading brass mills and a number of small plants in the Connecticut Valley district are on reduced schedules.

Copper — Despite curtailed operations at many copper fabricating plants, supplies are still short of requirements as a direct result of the recent strike of workers in the Utah producing field. Undertone of the market is strong due to the prospects of continued short supplies for some time, coupled with substantial requirements for the ECA countries and the government's stockpiling program.

Brass and Bronze Ingots — Reflecting the continued tapering in demand for brass ingot, a leading smelter reduced prices 3/4-cent to 1-1/2 cents a pound, effective Feb. 21. This widened the price spread to 2-1/4 cents on ingots in the 85-5-5-5 group, to 2-1/2 cents on No. 245 ingot, and 1-3/4-cent on the No. 405 yellow ingot. New buying is practically at a standstill, especially so far as the foundries are concerned.

Lead — No price changes were posted in the primary lead market last week, the common grade holding at 21.30c to 21.35c, St. Louis. Despite a drop in demand from cable makers and battery manufacturers, requirements of other consumers are still absorbing all tonnages offered by producers.

Zinc — Undertone of the slab zinc market remained firm last week. Although brass mills' needs have declined quite sharply, demand for

prime western zinc for automobile castings is holding at a high rate. Pressure for high grade zinc by the die casting industry is less than it was up to a few weeks ago.

Tin — Combined Tin Committee has issued additional interim allowances of tin for the first half of 1949 amounting to 11,634 tons, making the total announced to date 43,059 tons. Included in the new allotments are 5250 tons for the United States, making the total 24,500 tons for the first half; 2000 tons for Japan, initial allotment for the first half and 1210 tons for France, for a total of 5750 tons.

Production of tin concentrates in Indonesia) formerly referred to as Netherlands East Indies) declined 792 tons in January to a total of 2246 tons of fine tin equivalent. This is the smallest output since February, 1948.

The legislative council of the Federation of Malaya has agreed to the suggestion of the Tin Study Group that a number of international trade organizations should hold a commodity conference to draw up an international tin agreement. Malaya insists that the following provisions must be intended in the new agreement: 1. A firm guarantee of a market at an adequate price for the maximum period committed under the Havana Charter for all tin offered for sale by producing countries participating in the agreement; 2. an undertaking by all countries that the noncommercial stockpile would only be liquidated in a manner specified by the agreement which would not be detrimental to the economy of producing countries.

Castings Shipments Gain

Washington — Shipments of all classes of nonferrous castings, with the exception of aluminum, increased during December over November, according to the Bureau of the Census.

Shipments of copper and copper-base alloy castings during December totaled 88 million pounds, a slight increase over the 86 million pounds shipped in November, bringing the 1948 total to 1031 million pounds compared with 1052 million pounds in 1947. Sand castings accounted for about 90 per cent of the December shipments. At the end of December the volume of unfilled orders for commercial castings amounted to 54 million pounds, a drop of 12 per cent from the orders on the books at the end of November.

December shipments of aluminum and aluminum base alloy castings totaled 32 million pounds, 8 per cent below the 35 million pounds shipped in the preceding month. Annual 1948 shipments totalled 424 million pounds, 4 per cent lower than the shipments of 442 million pounds in 1947. December shipments of commercial castings, totaling 23.7 million pounds,

represented 74 per cent of the total. The backlog of orders for commercial castings at the end of December was 59 million pounds, representing about 2 1/2 months' activity.

Shipments of magnesium and magnesium-base alloy castings during December totaled 754,000 pounds, 4 per cent above the 728,000 pounds shipped in November. Total shipments in 1948 amounted to 8,214,000 pounds, 7 per cent above the 7,693,000 pounds shipped in 1947. Commercial castings accounted for 92 per cent of the total December shipments. Unfilled orders for commercial castings at the end of December indicated a backlog of 5 months' activity at the current rate of shipments.

Shipments of zinc and zinc-base alloy castings totaled 37 million pounds in December, a slight increase over the 36 million pounds shipped in November, bringing the 1948 total to 445 million pounds, or a slight increase over the 436 million pounds shipped in 1947. The backlog of commercial castings orders at the yearend represented about 3 months' operations.

December shipments of lead die castings rose 24 per cent to 1.4 million pounds from the 1.2 million pounds shipped in November. The 1948 shipments of 14.9 million pounds exceeded the 14.1 million pounds of 1947 by 5 per cent. There was a backlog of 1 1/2 months' orders on the books of commercial foundries at the end of the year.

The data given above are in terms of total shipments. These totals are estimates based on reports submitted by the larger foundries.

Platinum Price Drops \$4

New York — Price of platinum has been reduced \$4 an ounce by a leading refiner of the metal. New prices are \$81 an ounce for large lots and \$84 for smaller lots. The former quotations of \$85 and \$88, respectively, had been in effect since Feb. 15 when quotations were reduced \$5 an ounce. The latest price cut brings the prices in line with levels prevailing on sales of the metal by dealers and brokers. Demand from the jewelry trade continues light while inquiry from the chemical, electrical and other industries is running somewhat below normal.

Kenmore Metals Expands

New York — Kenmore Metals Corp. is increasing its plant capacity approximately four times through the acquisition of a long term lease on part of the property formerly occupied by the American Brake Shoe Foundry, 380 Ninth St., Jersey City, N. J., according to an announcement by Herbert Kenmore, president.

He said that the company's present production facilities at Warren, Pa., will be moved to Jersey City and that plant expansion is the result of increasing demand for new types of nicked steel wires introduced a few years ago. He also reported that prices of these wires, known commercially as fernickon, will be reduced approximately 25 per cent, which will make them actively competitive to tin and zinc-coated wires.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 18.75-21.00c; 88-10-2 (No. 215) 30.50c; 80-10-10 (No. 305) 26.25c; No. 1 yellow (No. 405) 15.75-17.50c.

Zinc: Prime western 17.50c, brass special 17.75c, intermediate 18.00c, East St. Louis; high grade 18.50c, delivered.

Lead: Common 21.30-21.35c, chemical and corroding 21.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloy (6-6 type) 22.50-23.75c; No. 12 foundry alloy (No. 2 grade) 21.50-22.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.00-25.00c; grade 2, 23.00-23.50c; grade 3, 22.25-22.50c; grade 4, 21.75-22.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) \$1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, \$1.028; grade C, 99.65-99.79%, incl., \$1.024; 99.5-99.649% \$1.024, grade F, 98.98-99.9% \$1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "R" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York \$88-\$94 per 70-lb flask.

Beryllium-Copper: 3.75-4.25% Be, \$24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, \$2 del.; special or patented shapes, \$2.10.

Cobalt: 97-98%, \$1.65 per lb for 550 lb (keg); \$1.67 per lb for 100 lb (case); \$1.72 per lb under 100 lb.

Gold: U. S. Treasury, \$35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: \$81-\$84 per ounce.

Palladium: \$24 per troy ounce.

Iridium: \$105-\$110 per troy ounce.

Titanium (sponge form): \$5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 37.18; yellow brass 34.59; commercial bronze, 95%, 37.23; 90%, 36.88; red brass, 85%, 36.01; 80%, 35.66; best quality, 35.33; nickel silver, 18%, 46.92; phosphor-bronze, grade A, 6%, 56.05.

Rods: Copper, hot rolled 33.28; cold drawn 34.28; yellow brass, free cutting, 38.16; commercial bronze, 95%, 36.92; 90% 36.57; red brass, 85% 35.70; 80% 35.35.

Seamless Tubing: Copper 37.22; yellow brass 37.60; commercial bronze 90% 39.54; red brass 85% 38.92; 80% 38.57.

Wire: Yellow brass 34.88; commercial bronze, 95% 37.52; 90% 37.17; red brass, 85% 36.30; 80% 35.95; best quality brass 35.62.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weather-proof, f.o.b. eastern mills, c.l. 29.60-29.85c, l.c.l. 30.30c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Nickel	Silver
Jan. Avg.	23.50	21.325	17.50	103.00	17.00	38.50	40.00
Dec. Avg.	23.50	21.325	17.50	103.00	17.00	38.50	40.00
Nov. Avg.	23.50	21.325	16.50	103.00	17.00	38.50	40.00
Feb. 1-10	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00
Feb. 11-12	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00
Feb. 14	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00
Feb. 15-24	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

ALUMINUM

Thickness Range, Inches	Widths or Diameters, In. Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-43	26.9	...	...
0.135-0.096	12-43	27.4	...	...
0.095-0.077	12-43	27.9	26.0	29.6
0.078-0.068	12-43	28.5	26.2	29.8
0.067-0.061	12-43	28.5	26.2	29.8
0.060-0.045	12-43	28.7	26.4	30.1
0.047-0.038	12-43	29.1	26.6	30.4
0.037-0.030	12-43	29.5	27.0	30.9
0.029-0.024	12-43	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Diam. (in.) or distance across flats	Stock: 5000 lb and over. Round— R17S-T4	Hexagonal— R317-T4	17S-T4
0.125	45.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, \$27.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft. Pipe: Full coils, \$27.25 per cwt.; cut coils, \$27.50. Traps and Bends: List price plus 70%.

ZINC

Sheets, 22.00-22.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.75-21.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.75-20.50c; over 12-in., 20.75-21.50c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 53.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb. 52.00-56.00c; 25 to 99 lb. 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 33.54c; oval 33.34c; electrodeposited, 31.00c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Seward, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices f.o.b. Seward, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, f.o.b. Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (anhydrous): In 400 lb bbl, 97.00c; in 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean	Rod	Clean
	Heavy	Ends	Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.875	18.625	18.125
Commercial Bronze			
95%	20.250	20.000	19.500
90%	20.125	19.875	19.375
Red brass			
85%	20.000	19.750	19.250
80%	19.875	19.625	19.125
Best Quality (71-79%)	19.750	19.500	19.000
Muntz Metal	18.250	18.000	17.500
Nickel, silver, 10%	20.250	20.000	10.000
Phos. bronze, A.	22.625	22.375	21.375
Naval brass	18.750	18.500	18.000
Manganese bronze ..	18.750	18.500	17.875

BRASS INGOT MAKERS

BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 18.50-19.00, No. 2 copper 17.50-18.00, light copper 16.50-17.00, composition red brass 14.25-14.50, auto radiators 12.50, heavy yellow brass 10.75-11.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.75, No. 2 copper 18.75, light copper 17.75, refinery brass (60% copper), per dry copper content 17.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.75-18.00, No. 2 16.75-17.00, light copper 15.75-16.00, No. 1 composition red brass 12.50-12.75, No. 1 composition turnings 12.00-12.25, mixed brass turnings 7.25-7.75, new brass clippings 15.25-15.75; No. 1 brass rod turnings 9.00-9.25, light brass 6.50-6.75, heavy yellow brass 9.00-9.25, new brass rod ends 11.75-12.25, auto radiators, unswaged 11.25-11.50, cocks and faucets 10.50-10.75, brass pipe 10.75-11.00.

Lead: Heavy 14.75-15.00, battery plates 7.00-7.50, linotype and stereotype 16.50, electrotype 15.00, mixed babbitt 19.00-19.50, solder joints, 22.00-23.00.

Zinc: Old zinc 8.00-8.50, new die cast scrap 8.50-9.00, old die cast scrap 5.50-6.00.

Tin: No. 1 pewter 64.00-66.00, block tin pipe 82.00-83.00, No. 1 babbitt 50.00-53.00, siphon tops 49.00-51.00.

Aluminum: Clippings 28 14.00-15.00, old sheets 9.50-10.00, crankcase 9.50-10.00, borings and turnings 5.00-5.50, pistons, free of struts, 9.00-10.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Hvy. Melt.	\$39.00
No. 2 Hvy. Melt.	37.00
No. 1 Busheling.	39.00
No. 1 Bundles.	39.00
No. 2 Bundles.	37.00
No. 3 Bundles.	35.00-36.00
Machine Shop Turnings	27.00-28.00*
Mixed Borings, Turnings	27.00-28.00*
Short Shovel Turnings	29.50-30.00
Cast Iron Borings.	26.00-27.00*
Bar Crops and Plate.	45.50-46.50
Low Phos. Steel.	44.00-45.00
Heavy Turnings.	35.50-37.50

Cast Iron Grades†

Mixed Yard.	45.00-46.00
No. 1 Machinery Cast.	59.00-60.00
Charging Box Cast.	49.00-50.00
Heavy Breakable Cast.	48.00-49.00
Brake Shoe.	47.00-48.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	42.00
Axles.	51.00-53.50
Rails, Random Lengths	47.00-48.00*
Rails, 3 ft. and under.	53.00-54.00
Rails, 18 in. and under.	54.00-55.00
Railroad Specialties.	48.00-50.00
Angles, Splice Bars.	54.00-55.00

* Brokers' buying prices.

† Nominal.

CLEVELAND

No. 1 Heavy Melt. Steel	\$37.00-37.50
No. 2 Heavy Melt. Steel	37.00-37.50
No. 1 Busheling.	37.00-37.50
No. 2 Bundles.	36.00-36.50
Machine Shop Turnings	26.00-27.00
Mixed Borings, Turnings	29.00-30.00
Short Shovel Turnings	29.00-30.00
Cast Iron Borings.	29.00-30.00
Bar Crops and Plate.	40.50-41.50
Punchings & Plate Scrap	40.50-41.50
Cut Structural.	42.00-43.00

Cast Iron Grades

No. 1 Cupola.	50.00-51.00
Charging Box Cast.	47.50-48.50
Stove Plate.	47.50-48.50
Heavy Breakable Cast.	42.50-43.50
Unstripped Motor Blocks	42.50-43.50
Malleable.	50.00-51.00
Brake Shoes.	44.00-44.50
Clean Auto Cast.	55.00-56.00
No. 1 Wheels.	52.50-53.50
Burnt Cast.	43.50-44.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.50-42.00
R.R. Malleable.	60.00-60.50
Rails, Rerolling.	58.00-60.00
Rails, Random Lengths	52.00-53.00
Rails, 3 ft. and under.	58.00-60.00
Cast Steel.	51.00-52.00
Railroad Specialties.	51.00-52.00
Uncut Tires.	48.00-50.00
Angles, Splice Bars.	54.00-55.00

VALLEY

No. 1 Heavy Melt. Steel	\$37.50-38.00
No. 2 Heavy Melt. Steel	37.50-38.00
No. 1 Bundles.	37.50-38.00
Machine Shop Turnings	30.00-31.00
Short Shovel Turnings	32.00-33.00
Cast Iron Borings.	32.00-33.00
Low Phos.	44.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.50-42.00
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MANSFIELD

Machine Shop Turnings	\$30.00-31.00
Short Shovel Turnings	32.00-33.00

CINCINNATI

No. 1 Heavy Melt. Steel	\$33.00
No. 2 Heavy Melt. Steel	31.00
No. 1 Busheling.	33.00
Nos. 1 & 2 Bundles.	33.00

Machine Shop Turnings	23.00
Mixed Borings, Turnings	23.00
Short Shovel Turnings	25.00
Cast Iron Borings.	24.00

Cast Iron Grades

No. 1 Cupola Cast.	50.00
Charging Box Cast.	41.00
Heavy Breakable Cast.	40.00
Stove Plate.	41.00
Unstripped Motor Blocks	36.00
Brake Shoes.	38.00
Clean Auto Cast.	50.00
Drop Broken Cast.	54.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	35.00
R.R. Malleable.	50.00
Rails, Rerolling.	50.00
Rails, Random Lengths	44.00
Rails, 18 in. and under.	52.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Heavy Melt. Steel	\$32.50-33.00
No. 1 Busheling.	32.50-33.00
No. 1 Low-phos.	
Bundles.	36.00-37.00
No. 2 Bundles.	32.50-33.00
Machine Shop Turnings	22.50-23.00
Mixed Borings, Turnings	22.50-23.00
Short Shovel Turnings	23.50-24.00
Cast Iron Borings.	25.00-26.00
Punchings & Plate Scrap	37.00-38.00

Cast Iron Grades

No. 1 Cupola Cast.	38.00-40.00
Heavy Breakable Cast.	33.00-35.00
Clean Auto Cast.	38.00-40.00

BUFFALO

No. 1 Heavy Melt. Steel	\$39.00-40.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling.	34.00-35.00
No. 1 Bundles.	34.00-35.00
No. 2 Bundles.	31.00-32.00
Machine Shop Turnings	28.00-30.00
Mixed Borings, Turnings	28.00-30.00
Cast Iron Borings.	29.00-30.00
Short Shovel Turnings	30.00-31.00
Low Phos.	39.00-40.00

Cast Iron Grades

No. 1 Cupola.	43.00-45.00
Mixed Cupola.	39.00-41.00
Heavy Breakable Cast.	40.00-42.00
Malleable.	55.00-60.00
Clean Auto Cast.	48.00-50.00

Railroad Scrap

Rails, 3 ft. and under.	55.00-55.50
Railroad Specialties.	49.00-51.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	\$39.00-40.00
No. 2 Heavy Melt. Steel	35.00
No. 1 Busheling.	35.00
No. 1 Bundles.	38.00
No. 2 Bundles.	33.00
Machine Shop Turnings	31.00-31.50
Mixed Borings, Turnings	31.00-31.50
Short Shovel Turnings	32.00-33.00
Bar Crop and Plate.	41.00-42.00
Punchings & Plate Scrap	41.00-42.00
Cut Structural.	41.00-42.00
Elec. Furnace Bundles.	41.00-42.00
Heavy Turnings.	38.00-39.00
No. 1 Chemical Borings	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast.	40.00-42.00
No. 1 Machinery Cast.	45.00-46.00
Charging Box Cast.	42.00
Heavy Breakable Cast.	42.00
Unstripped Motor Blocks	37.00-37.50
Clean Auto Cast.	42.00
No. 1 Wheels.	47.00-48.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	\$30.00
No. 2 Heavy Melt. Steel	28.00

No. 1 Busheling.	28.00
No. 1 Bundles.	30.00
No. 2 Bundles.	28.00
No. 3 Bundles.	26.00
Machine Shop Turnings	22.00-23.00
Mixed Borings, Turnings	22.00-23.00
Short Shovel Turnings	23.00-24.00
Punchings & Plate Scrap	34.00-35.00
Cut Structural.	34.00-35.00
Elec. Furnace Bundles.	32.00-33.00

Cast Iron Grades

No. 1 Cupola Cast.	38.00
Charging Box Cast.	36.00-37.00
Heavy Breakable.	36.00
Unstripped Motor Blocks	34.00
Malleable.	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	\$30.00-31.00
No. 2 Heavy Melt. Steel	28.00
No. 1 Bundles.	30.00-31.00
No. 1 Busheling.	27.00
No. 3 Bundles.	27.00
Machine Shop Turnings	22.00-23.00
Mixed Borings, Turnings	22.00-23.00
Short Shovel Turnings	25.00-26.00
Bar Crops and Plate.	32.00-33.00
Punchings & Plate Scrap	32.00-33.00
Chemical Borings.	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast.	42.00-43.00
Heavy Breakable Cast.	37.00-38.00
Stove Plate.	30.00-32.00
Unstripped Motor Blocks	29.00-30.00
Clean Auto Cast.	34.00-36.00

CHICAGO

No. 1 Heavy Melt. Steel	\$33.00-35.00
No. 2 Heavy Melt. Steel	30.00-33.00
No. 1 Bundles.	33.00-35.00
No. 2 Bundles.	28.00-31.00
No. 3 Bundles.	26.00-29.00
Machine Shop Turnings	24.00-25.00
Mixed Borings, Turnings	24.00-25.00
Short Shovel Turnings	24.00-25.00
Cast Iron Borings.	24.00-25.00
Bar Crops and Plate.	37.00-40.00
Punchings.	38.00-40.00
Elec. Furnace Bundles.	36.00-38.00
Heavy Turnings.	32.00-34.00
Cut Structural.	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast.	40.00-43.00
Clean Auto Cast.	40.00-45.00
No. 1 Wheels.	41.00-42.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	36.00-37.50
Malleable.	42.00-44.00
Rails, Rerolling.	45.00-46.50
Rails, Random Lengths	42.50
Rails, 3 ft. and under.	46.00
Rails, 18 in. and under.	46.00-47.00
Railroad Specialties.	42.00-43.00
Angles, Splice Bars.	44.00-45.00

ST. LOUIS

No. 1 Heavy Melt. Steel	\$34.00-35.00
No. 2 Heavy Melt. Steel	29.00-30.00
Machine Shop Turnings	23.00-24.00
Short Shovel Turnings	24.00-25.00

Cast Iron Grades

No. 1 Cupola Cast.	46.00-48.00
Mixed Cast.	39.00-40.00
Heavy Breakable Cast.	32.00-35.00
Brake Shoes.	35.00-37.00
Clean Auto Cast.	50.00-52.00
Burnt Cast.	35.00-37.00

Railroad Scrap

R.R. Malleable.	40.00-45.00
Rails, Rerolling.	46.00-48.00
Rails, Random Lengths	42.00-43.00
Rails, 3 ft. and under.	48.00-50.00
Uncut Tires.	40.00-41.00
Angles, Splice Bars.	42.00-45.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	\$33.00
No. 2 Heavy Melt. Steel	33.00
No. 1 Busheling.	32.00-33.00
No. 2 Bundles.	30.00-31.00
Long Turnings.	25.00
Short Shovel Turnings	27.00
Cast Iron Borings.	27.50

Bar Crops and Plate.	38.00
Cut Structural.	38.00

Cast Iron Grades

No. 1 Cupola Cast.	48.00-50.00*
Stove Plate.	42.00-43.00*
No. 1 Wheels.	44.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable.	nom.
Axles, Steel.	60.00-62.00
Rails, Rerolling.	52.00-55.00
Rails, Random Lengths	38.00-40.00
Rails, 3 ft. and under.	46.00-48.00
Angles and Splice Bars	46.00-48.00

* Nominal.

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*\$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling.	*25.00
Nos. 1 & 2 Bundles.	*23.00
No. 3 Bundles.	*15.00
Machine Shop Turnings	*20.00
Bar Crops and Plate.	*25.00
Cast Steel.	*25.00
Alloy Free Turnings.	*15.00
Cut Structural.	*25.00

Cast Iron Grades

No. 1 Cupola Cast.	43.00
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Railroad Scrap

No. 1 Heavy Melting.	*26.00
Wheels.	*29.50
Rails, Random Lengths	*26.50

*F.o.b. California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	\$27.50
No. 2 Heavy Melt. Steel	27.50
No. 1 Busheling.	27.50
Nos. 1 & 2 Bundles.	27.50
No. 3 Bundles.	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punchings & Plate Scrap	35.00
Cut Structural.	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast.	35.00
Heavy Breakable Cast.	35.00
Stove Plate.	30.00
Unstripped Motor Blocks	32.50
Malleable.	40.00
Brake Shoes.	35.00
Clean Auto Cast.	40.00
No. 1 Wheels.	37.50-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable.	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

LOS ANGELES

No. 1 Heavy Melt. Steel	\$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles.	23.00
No. 3 Bundles.	20.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00-16.00
Punchings & Plate Scrap	33.00-36.00

Cast Iron Grades

No. 1 Cupola Cast.	\$32.50-37.50
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WORLD'S BIGGEST MOTO-CRANE brings rubber-tire mobility to biggest jobs!

This is *it*—MC-820 . . . biggest of the big . . . a giant Moto-Crane *on rubber* with a lifting capacity of 90,000 lbs. . . capable of speeds up to 18 M.P.H. under its own power for "on the spot" operation at a moment's notice. Now, an industrial material handling or construction job *can't come too big* for this mammoth Moto-Crane on its rubber-tire mounting.

Before the MC-820, it often took days just to rig a job before a lift could be made or construction started. Today the MC-820 will roll right up to that same job—*fast*—and complete it in a matter minutes—at amazing savings in time and manpower!

Hundreds of smaller Lorain Moto-Cranes have clearly demonstrated the advantages of Moto-Crane mobility. These same money-saving benefits are now available to you on bigger jobs than ever before—with the biggest rubber-tire mounted machine of them all—a Lorain MC-820!

THEW-LORAIN

MC-820



This mighty, MC-820 Moto-Crane is at work for the Jones & Laughlin Steel Corp., unloading and erecting components for additional plant facilities.



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TODAY**

**The Thew Shovel Company
Lorain, Ohio**

Gentlemen:
You can send me the facts and specifications
on the Moto-Crane, MC-820.

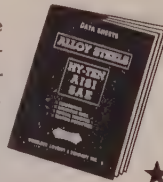
Name _____
Company _____
Street _____
City _____ State _____



The selection of alloy steel grades necessarily varies with each manufacturer's needs and opinions. Some prefer HY-TEN alloy steel, while others recommend standard A. I. S. I. steel. However, differences in choice need not mean different sources of supply . . . just contact the Wheelock, Lovejoy warehouse nearest you. There you will find all grades of HY-TEN alloy steel as well as standard A. I. S. I. . . . grades to meet every need and opinion. By dealing with Wheelock, Lovejoy, you have the advantage of prompt delivery from a nearby source, plus courteous help from men who know metallurgy.

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HY-TEN

and **AISI**

Sheets, Strip . . .

Follansbee Steel Corp. reduces silicon sheet prices to competitive level

Sheet Prices, Page 126

Pittsburgh—Follansbee Steel Corp. reduced silicon sheet prices to following levels per 100 lb, effective Feb. 23, with transformer grades remaining unchanged.

	New	Old
Electrical	5.95	7.45
Motor	6.70	7.95
Dynamo	7.50	8.65

The reduction places these items on competitive price basis with those in effect among bulk of producers. Follansbee continues to quote above general market price level for transformer grades, as is also the case with Allegheny Ludlum Steel Corp.

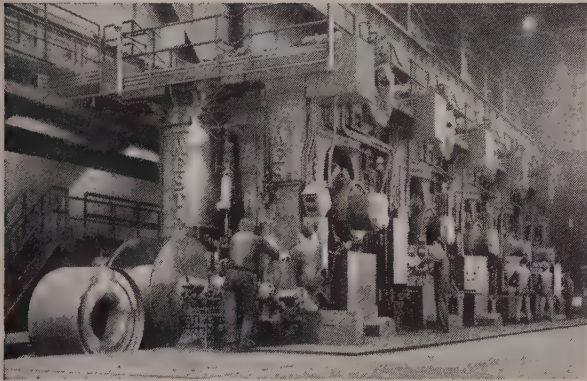
Boston — Supply is catching up with demand more rapidly than expected on more steel products and for some items tonnage is in excess of requirements, although in flat-rolled the surplus is confined largely to specialties, including stainless. Some mills, operating close to 100 per cent, are turning out more finished steel than is being booked; thus, inroads on backlogs are accelerated. Sheet and strip specifications are still heavy, but with cutbacks and suspensions, scramble for tonnage has eased. More steel is likely to be shipped in second quarter than is newly booked with backlog volume sufficient to plug any gaps for maintenance of near capacity production. Stove and range builders are taking but a fraction of steel ordered several months ago, and while manufacturers of other household goods and appliances are also affected, former group is among the slowest. There are some tight spots with only slight decline in buying, tack plate included. Hot strip supply for converting units continues limited and unbalanced but cold reducers are more hopeful for next quarter.

New York — Spot openings in hot and cold-rolled sheets and strip are somewhat more numerous, yet aggregate tonnage released is still not heavy and is quickly absorbed. One large producer comments in particular on an easing situation in cold-rolled strip. Some of his customers appear to have reached a point where inventories are in reasonable balance and have reduced specifications. Most sellers are still confident they will have all the orders they can handle for some few months to come, although admitting their customers may share in a larger portion as time goes on. Meanwhile, they are setting up second quarter quotas on about the same basis as at present.

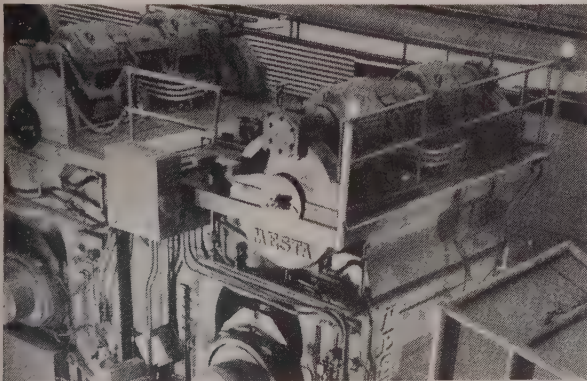
Philadelphia — Tendency among certain inland sheet mills to withdraw from the local market because of freight disadvantage appears to have been checked for the present at least. Most second-quarter quotas show no further decline and in certain instances where mills have virtually withdrawn on major grades they have been sounding out some of their older and more important accounts as to future needs. However, little, if any, new tonnage has been definitely

Torrington Bearings

Put on the Pressure in Record-breaking Steel Mill

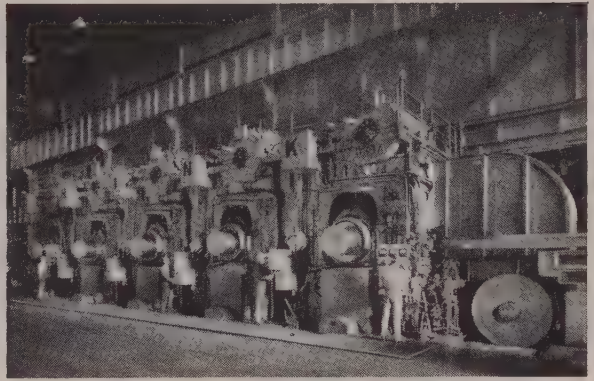


To roll strip fast is to roll it fine—in quality and uniformity. So, to make better strip, Mesta Machine Company designed and built the new Jones & Laughlin tandem strip mill for record speed—6,250 fpm. And it's equipped for top performance with Torrington Bearings on work rolls, screw downs and take-up reel.

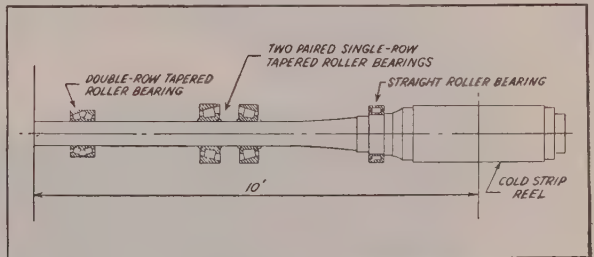


The mill screwdowns bear down on back-up rolls through Torrington heavy-duty Thrust Bearings, Type LR. The smooth operation and low starting torque of these bearings helps make the screwdowns the fastest in response action and the speediest ever installed on a tandem mill.

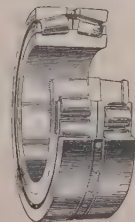
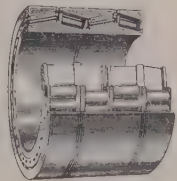
The exceptional service delivered by Torrington Bearings is based on our years of experience in designing, building and applying all major types of anti-friction bearings. For engineering assistance from design to maintenance, contact our nearest office. THE TORRINGTON COMPANY, South Bend 21, Ind., or Torrington, Conn. District offices and distributors in principal cities.



The pressure that reduces strip from 1/11" to 1/100" at more than a mile a minute imposes extreme loads on Work Roll Bearings. The design and high capacity of the Torrington four row Tapered Roller Bearings enable them to give exceptional service at this high speed despite tremendous radial and thrust loads.



The take-up reel is of the mill-tested design shown here in cross-section, equipped with Torrington single and double-row Tapered Roller Bearings. Supporting the reel at one end only, the bearings are designed for maximum radial and thrust capacity to maintain high tension on the strip.



TORRINGTON *TAPERED ROLLER* **BEARINGS**

ATLAS

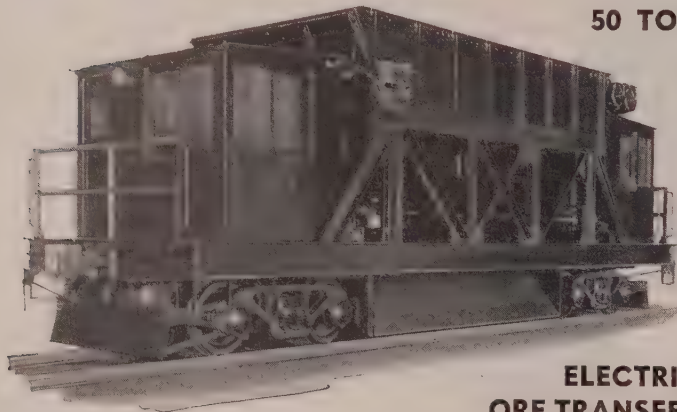
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**ELECTRIC
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GABLE BOTTOM**

Car built in two sections with independently operated discharge gates for either side of track. Car has self-aligning journal bearings, electric heaters and is propelled with two 75-HP motors. Equipped with air brakes, sanders and standard safety equipment.



50 TON

**ELECTRIC
ORE TRANSFER
GABLE BOTTOM SIDE DUMP**

Car has single discharge gates on either side, operated pneumatically. Trucks have self-aligning journal bearings each mounting a 75-HP motor. Car equipped with air brakes and other standard safety equipment.

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promised for next quarter.

Cincinnati—Sheet mills, preparing schedules for second quarter, find demand in excess of output. Recent developments, however, point to a new trend. Sheet buyers are watching inventories more closely and, while taking full allotments, have warned mills against premature shipment. Cancellations, mainly in smaller lots, continue to come from household equipment manufacturers. Mill interests unofficially foresee capacity demands for carbon steel sheets for the entire year.

Delphos, O. — New Delphos Mfg. Co. is offering, subject to prior sale, the following Follansbee forge prime special pickled, blued and oiled, sheets, all 30 gage at \$6.35 per 100 pounds, f.o.b. cars, this city; 10,330 pounds, 17-1/4 x 21 inches, 9790 pounds, 16-3/4 x 29 inches; and 6030 pounds, 13-3/4 x 22-1/2 inches.

Birmingham — Demand for practically all flat rolled products continues strong. Little improvement is evident in supplies, even though consumers show little spirit in bidding for supplies. A scattered few of them have quit the field.

Los Angeles — Cancellations of sheet orders are more numerous and, although they are not on a scale large enough to ease the supply situation, their steady increase is noteworthy. Overall demand is strong with mills booked into the latter part of the second quarter. Galvanized and cold-rolled materials are as tight as ever, with most of the mill cancellations affecting hot-rolled—and coming principally from appliance manufacturers. Facing decreased demand, these users find in many instances that their product inventories comprise costly items made of conversion or gray market materials. Arrangements for such supplies have now largely been abandoned. General feeling is that appliance manufacturers will be back in the market for mill-price materials, once they have trimmed down more expensive inventories. Extreme seasonal activity now marks the production of coolers, air conditioning, and refrigerating equipment.

San Francisco—Slackening of business volume for many fabricators is increasing tendency to buy flat-rolled products on hand-to-mouth basis. Although supplies still are less than total demand, buying is considerably more spotty. Some users believe they'll be able to get larger tonnages from mills in near future and are in no hurry to order in advance.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 126

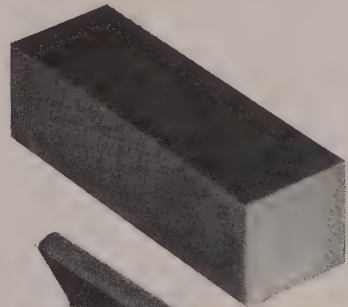
Seattle—Rolling mills are at maximum capacity and, although backlogs are down compared with a year ago, orders for bars now on the books will carry well through the current year. Considerable tonnage in less than 100 ton lots is offered. Finished stock is accumulating at the mills because of disruption of both rail and truck transportation by heavy snow in the mountains, delaying deliveries and upsetting schedules. This situation is not expected to be corrected for some time. Jobbers are ordering in less volume than

Save steel, work and time with

DISSTON

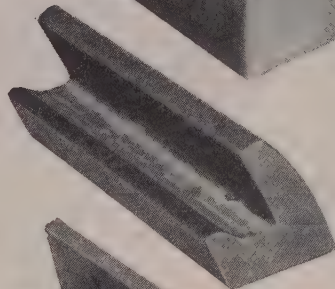
HOT ROLLED TOOL STEEL SHAPES

Why pay for all this Bar Stock . . 38 oz.

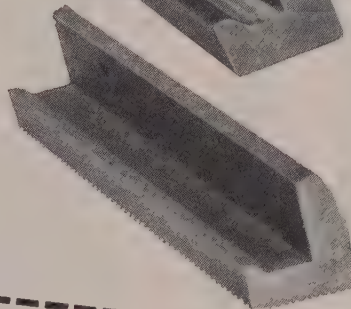


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WHY NOT START HERE!



To make this Vise Jaw Insert . . 13³/₄ oz.



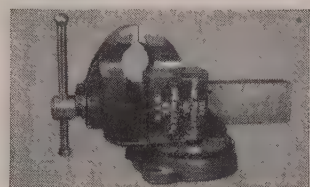
Disston Hot Rolled Shapes can save you up to 50% or more on the tool steel you now use. By using the hot rolled shape shown above the saving in steel amounts to 55.26%. And, even more important, there is a saving in machining time, for these Disston shapes are rolled to close tolerances.

Disston Hot Rolled Shapes are supplied in many forms and sizes . . . in alloy and carbon tool steels . . . in electric and open hearth grades.

Send us dimensional sketches of the shapes you use, together with the analysis and approximate quantities desired. Full particulars will be sent to you promptly.



Disston metallurgists and engineers will be glad to help you solve any of your tool steel problems.



No. 974¹/₂ Machinist's Vise, a product of the Charles Parker Co., Meriden, Conn.

ANALYSIS OF STEEL USED

CARBON . . . . .	.45/.55
MANGANESE . . . . .	.60/.90
PHOSPHORUS and SULPHUR } . . . . .	.040 max.
SILICON . . . . .	.20/.35
CHROMIUM . . . . .	.80/1.10

STEEL: Everybody who wants to obtain steel can help himself to get it by immediately starting scrap in to the channels that serve steel mills.



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Uniform by all the measurements of quality spring wire. Rigid control of chemical composition and processing methods assure its uniformity and structural soundness. Our specialized coiling, twist and bend tests are added safeguards of dependability.

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KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

several months back. Small angle supply is critical. Northwest Steel Rolling Mills, Inc., plans to roll this item, 2½ inches and under, each quarter. Larger angles are easier.

Steel Bars . . .

Bar Prices, Page 126

New York — Hot carbon bar producers report a material slowing up in specifications from car builders and railroad shops, notably the latter. They assert, however, that demand is still active in most lines and that they are having no difficulty in finding place for such tonnage as is being released. Mills generally have set up consumer quotas for shipment beyond the end of this quarter on the current basis, although some indicate they may be able to do a little better once the second quarter gets under way. Warehouses are still pressing hard for tonnage, especially flats.

Cold-drawn bar consumers are having little difficulty in placing all the tonnage they require for second quarter. Most cold drawers can promise shipments for May. Demand for alloy bars still lags, with tonnage available in April and beyond. This applies to both hot and cold alloy.

Pittsburgh — Slight easing in carbon bar supply is reported by some forging shops, although sellers contend output continues to fall far short of meeting requirements despite occasional order cancellation or hold-up resulting from inventory adjustments among a few customers. Cold finishers state production schedules remain full for the first half, in some instances extending into third quarter. Output of cold-finished bars is geared to inadequate hot-rolled bar supply. There has been some easing in inquiries for alloy cold-finished bars and to a lesser extent for bessemer stock. Another source of demand weakness is from some screw machine shops organized during the war period. Work previously "farmed out" is gradually being withdrawn by larger metalworking companies.

Boston — Marking trends in bar buying consumers are paying more attention to inventory, quality and price factors. There is some reordering of previous cutbacks, but, with exception of hot-rolled carbon stock, bars are generally moving at lower levels. All grades which have been under allocation continue on quotas, but this excludes cold-finished with most producers. In some instances, consumers are not taking full allocations, but unwanted volume up to now is distributed in other directions. Alloys are not yet influenced by defense requirements to the extent expected, increased tonnage being moderate. Flats in all grades continue in limited supply; open-hearth alloys have eased.

Philadelphia — While second-quarter quotas of hot carbon bars are generally on the current basis, the outlook appears to be easing somewhat, with consumers hopeful that before the half ends they will be in position to obtain more tonnage, if so desired. At least one midwestern bar mill which had been practically out of the market here for some

months on hot carbon bars is showing more interest again in market possibilities here, contacting certain old customers. Little tonnage is being promised for second quarter, but hope is extended that more steel may be available later on. Some cutbacks by railroads and anthracite lines are reported.

Structural Shapes . . .

Structural Shape Prices, Page 127

New York — Structural demand continues spotty, with inquiry dominated by public work. Several bridge jobs are actively pending, although local work is modest in size. Most fabricators look for increasing activity in office and apartment construction, as demand for this type of space is still pressing and as building supplies and components are definitely easier to obtain. As a result of easier supply, some builders are moving slowly on the theory that prices soon may show a decline, but most believe that such declines as may develop in the near future will not prove too important and that much is to be said for a condition where costs appear to be leveling off and where supplies have reached a point where definite deliveries can be counted upon.

Pittsburgh — Inquiries for industrial expansion programs show no signs of reviving from relatively low levels reported in recent weeks. Structural fabricators have made considerable headway against order backlogs despite continued shortage of shapes and plates. New work is attracting considerably more bidders than in recent past, reflecting dwindling order backlogs.

Philadelphia — Although industrial and commercial construction lacks much promise at present, fabricators declare that further expansion in public work appears likely. An increasing amount of state work may develop within the next several weeks, and there is quite a little institutional work in prospect. Meanwhile, the largest new industrial project in this district involves 450 tons for an enameling plant for Kaiser Fleetwing Inc., Bristol, Pa.

Birmingham — Not a great deal of structural business is being placed, although the situation in shapes is described as "rather tight." One answer is that shape production has not been maintained at as high a level as some more wanted items and a few sizable public contracts have accounted for considerable tonnage.

Los Angeles — Although heavy structurals are moving very slowly, demand is active for light sections. Very few large construction projects are being released, but numerous small jobs are coming out after being shelved for price reasons. The feeling in this case is that recent price declines have flattened out construction costs to the point where it seems practical to proceed.

San Francisco — A combination of slightly increased supplies and seasonal reductions in demand have eased tightness recently, but overall shortages of many items continue. Major part of structural demand currently

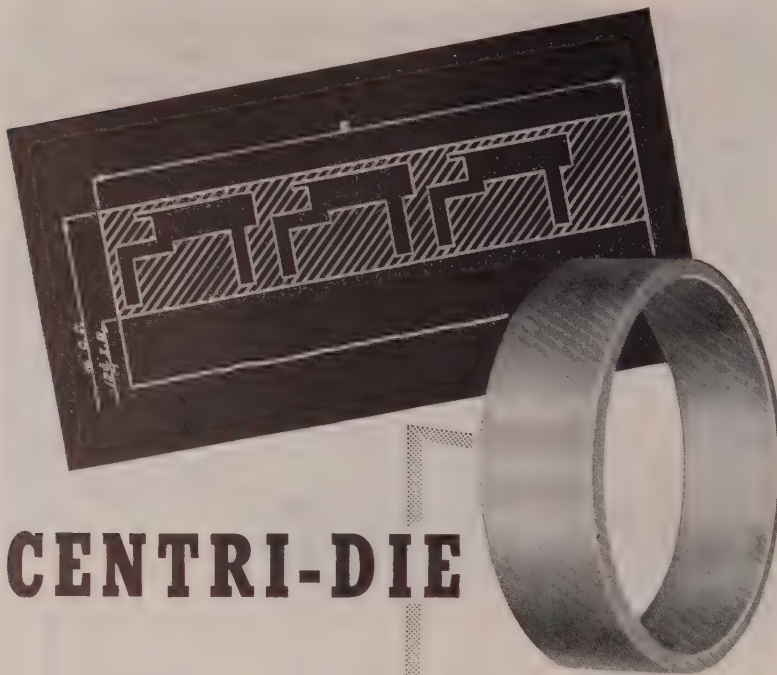


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give **5** times the life and . . .
at only 30% extra in cost. HARD-DUR Gears preserve the tooth form because they are made of the finest gear steels and are scientifically heat treated. They handle the tough jobs on which ordinary gears fail . . . a trial will prove that it's easier with HAR-DUR.

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Illustrated above is a cross section of the metal ring shown in the photograph. Notice how three rings of intricate cross section have been grouped in this one cylinder to conserve metal. By Lebanon's CENTRI-DIE process of centrifugal casting a uniform metal structure is assured throughout each ring as finally machined.

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uniformity
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LEBANON
ALLOY AND STEEL

Castings



is coming from public works projects.
Seattle—The volume of small jobs is about normal for this season, according to fabricators. Wide flange shapes are still scarce with no increase in allotments. Scarcity of pipe and light gage sheets is also a handicap. Bidding is confined to inventory limitations.

Structural Orders Decline

New York—Structural bookings for January declined to 125,834 tons, according to preliminary figures by the American Institute of Steel Construction. This compares with 169,553 tons in December and 160,634 tons in January, 1948. Shipments dropped to 147,659 tons from 182,370 tons in the previous month, but were slightly higher than the 146,363 tons shipped in January, 1948. Backlog for the next four months only stands at 675,464 tons.

Plates . . .

Plate Prices, Page 127

Philadelphia — District plate mills continue to operate at the highest sustained rate in many months, with raw materials adequate and little or no labor difficulties. One high-premium mill is pursuing a more aggressive sales policy, but in general mills still have more inquiries on hand for shipment over the next several months than they believe they can meet. There are soft spots in some consuming lines, which has taken off some of the pressure, but in general the outlook is still active, notwithstanding lack of new car buying and the possible effect this may have later on. Actually some railroads, which are curtailing equipment repairs, are cutting back on specifications. One large eastern carrier is planning to reduce its requirements over the next few months by about 20 per cent. In certain products, it has indicated a drop in needs of 50 per cent.

Birmingham — Even though demand for plates has eased in a few scattered quarters, the general scarcity of tonnage more than offsets any beneficial results therefrom. The general situation in plates continues to be described in authoritative sources as "exceedingly tough."

Los Angeles — Supply situation shows no improvement, with requirements far in excess of production. Although there is talk of an easing up in plates, fabricators are receiving no more than before, and in some instances less than last year.

San Francisco — Plate supply continues to be well below demand and prospects are that scarcity of this material will continue.

Seattle—Plates continue critical and plants are careful in figuring large contracts. Considerable business is reported up for bids. Mill allocations are well below normal requirements.

Southwest Expansion Continues

Houston—Because of the natural flow of industries to the Gulf Coast area, industrial construction in the Southwest in 1949 will at least equal the high level reached in 1948,

it was forecast today by C. W. Roberts, southern district manager, H. K. Ferguson Co., industrial engineers and builders of Cleveland, New York and Houston.

"This section is potentially the future chemical center of the world," Mr. Roberts said, following a survey of building prospects conducted by his firm. "The combination of raw materials, low power and fuel costs, and excellent rail and water transportation invite location here.

"Wage increases already granted or in the making will increase construction costs in the Southwest, but the increase will be offset somewhat by better labor productivity and improved materials. The leveling off or decline of public and private housing construction in this area should make more labor and materials available for industrial projects."

Tubular Goods . . .

Tubular Goods Prices, Page 127

New York—Leading producers of merchant pipe are becoming more current on shipments, although this does not mean that supply and demand are as yet in balance. This still appears to be some distance off. Producers who have restricted quotas and in some instances have done so by blanking out whole months are at least living up to present promises and in some important instances are actually producing more than they are booking. This probably means they will be able soon to increase their quotas, although probably not to the extent that district consumers will desire.

Requirements of utilities are still running well in excess of supply, and plumbing supply houses report that their pipe stocks are still far out of balance. However, they add that inventories in most all lines but pipe are now in good shape and that they are offering discounts to facilitate movement in some items.

Upstate this easing in plumbing supplies has actually extended to pipe, reflecting the falling off in demand from knitting mills, car shops and manufacturers of household heating equipment.

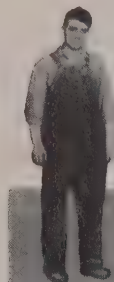
Oil company demands are definitely easier here, reflecting in part the mild weather as it has affected heating oil. Conversion deals involving oil pipe have fallen off sharply. In fact, few new conversion deals are being made.

Construction work here involves few outstanding pipe jobs. About the largest lot now figured for this purpose involves 224 tons of 2 to 10 inch pipe for the United Nations Secretariat building. This pipe is involved in the plumbing contract which has been let to Eugene Duklauer Inc., 215 East 38th St. Later, under a different contract, bids will be asked for 116 tons of 3/4 to 14 inch pipe for air conditioning. Should the United Nations' building project go ahead in its entirety, an estimated 4000 tons of pipe would be required.

Chicago — Steel pipe and tubing manufacturers are unable to see any easing in overall demand, despite scattered soft spots in consumers' operations. Reductions in demand for mechanical tubing mean little to produc-

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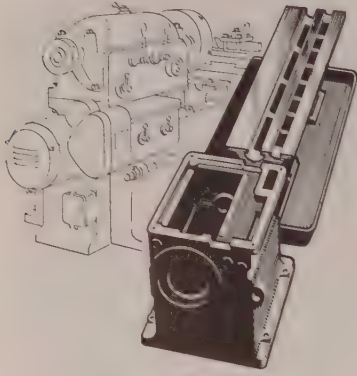


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ers whose customer allocations have been far below requirements. Slackening in home building activity has had no apparent effect on jobber pressure for more pipe, since stocks cannot be built up rapidly at present rate of receipts. One interest reports its backlog for conduit extends about a year. However, all producers are looking to their competitive positions, and in order to remain a factor in certain markets numerous independents are absorbing freight and otherwise meeting competition. Producers occasionally see signs that their semifinished supply problems are decreasing, one instance being reported of a mill shipping its quotas two to three weeks in advance of schedule. Plate supply, however, is as tight as ever and excess of demand over supply of large diameter pipe appears stretching far into the future.

Los Angeles—Despite the fact supplies still are not adequate, tubular products are coming closer to meeting requirements. Major exception is large-diameter pipe, which will be in short supply for some time to come. But suppliers of small-diameter tubing, a product which is directly affected by the reduced demand of oil fields and refineries, are able to meet the present needs of most users.

San Francisco—Some signs of a letdown in demand for steel pipe may be wiped out this spring when oil producers feel seasonal pick-up. Stainless steel tubing continues plentiful.

Seattle—The cast iron pipe market has an improved outlook as several sizable projects are to be offered for bidding soon. The situation is better also because shipments by water are arriving regularly.

Warehouse . . .

Warehouse Prices, Page 129

Pittsburgh—One steel distributor has reduced base prices on hot-rolled strip \$7 a ton to \$5.10 per 100 pounds, and simultaneously raised the size extras on this product which in some instances more than offset the reduction in base price. The size extra for 1-inch wide, 3/16-inch thick strip was raised to \$1.05 from 55 cents. The base price range for hot-rolled strip currently is from \$5 to \$5.10 per 100 pounds among distributors here. All distributors are quoting \$7.15 per 100 pounds for 10 gage galvanized sheets. Inventory position of warehouses is fairly good on cold-finished bars, stainless and alloys. Cold-drawn mechanical tubing stocks remain in short supply, due in part to substitution of this item for standard pipe by some consumers because of inability to obtain latter item. Plate and structural items also remain scarce. No significant change is noted on inventory position of sheets and bars.

Cincinnati—Steel jobbers look to the next quarter with hope for heavier mill shipments so that they may close the long-enduring gap between supply and demand. So far, such shipments have held to previous levels, without any hint of easing in supply. Inquiries are fewer and fabricators are holding closer to speci-

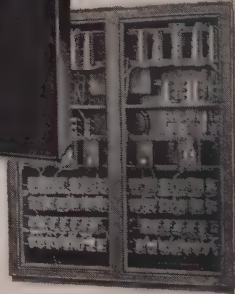
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cations, but warehouses are still unable to meet all ordering and stocks are unbalanced.

Los Angeles — Steel jobbers report their new orders continue to increase over the November-December level, with the pickup in several instances being considerable. Some warehousemen are baffled by the unexpected revival; others ascribe it to improvement in the business atmosphere; one jobber believes it may signal a return to the prewar pattern of seasonal ups and downs. Inventories are improved in bars, tubing, and structurals, but lack of balance still is apparent in short supplies of sheets and plates. Warehouse stocks are benefiting somewhat from the offerings of manufacturers who have excess inventories and feel they can now safely give up surplus. This has extended to sheets, but limited generally to off-size sheets which were cut to specifications.

San Francisco — Prompter deliveries from mills and some increases in supplies in prospect for coming months are reported by some warehousemen. However, hand-to-mouth buying by many customers and the shift to direct purchases from mills has reduced business during last month or two. Some slight pick-up has been noted in February and seasonal spring rise in activity may tend to level-out recent declines. Gray market operators have reduced quotations on many items by 40 to 50 per cent, although gray offerings still are running about double warehouse prices.

Seattle—Unfavorable weather continues to slow jobbing turnover, although part of the decline in volume is attributed to a general overall recession. Plates, pipe and sheets are still the critical items, but nails are in better supply, due in part to reduced sales because of slowing of outside work. The power shortage in this area has curtailed manufacturing operations and this is reflected in a lesser volume by wholesalers. Local houses report they have absorbed the 5 per cent increase in railroad rates, but if further concessions are made to the carriers, jobbers will revise price lists. Meanwhile, additional tonnage is coming by water which offers lower freights, although some finished items are routed overland because of possible damage on the water route.

Wire . . .

Keystone Steel & Wire cuts prices \$4 to \$7 per ton on wire and wire products

Wire Prices, Page 127

Chicago — Keystone Steel & Wire Co., Peoria, Ill., effective Feb. 18, lowered its major wire and wire products prices to bring them into conformity with those of larger district producers. Keystone's new prices are: Manufacturers bright, low-carbon wire, 4.15c; merchant quality wire, annealed, 4.80c, galvanized, 5.25c; woven wire fence, col. 109; barbed wire, col. 123; and nails and staples, col. 103. Manufacturers wire is quoted f.o.b. Chicago, while the other items are based at both Chi-

cago and Pittsburgh.

Producers note some easing in demand and a return for the first time in eight years of price consciousness by some consumers. Poultry netting is reportedly the slowest moving item in the wire field and distributor inventories are high. Stocks of nails of all specifications, barbed wire and fence post, however, are low and unbalanced.

Birmingham — Moderate easing in wire was still evident last week, but mill sources look for no real continuation of that picture. Overall, demand still is in excess of supplies, especially in wire products for agricultural use. A somewhat better relationship between supply and de-

mand is evident in manufacturers' wire.

Los Angeles—Although demand is strong, most wire products are in good supply. Bethlehem Pacific Coast Steel Corp.'s new wire mill here has been active since it began production last August, although lack of material has prevented capacity operation.

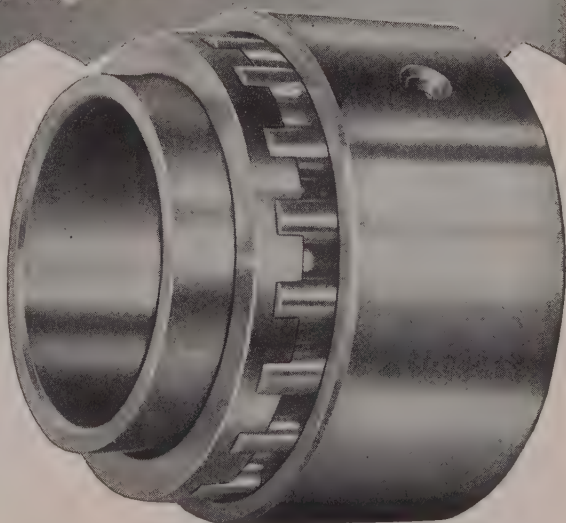
Manganese Ore . . .

New York — India has set up a quota of 125,000 tons for export of manganese to the United States in the three-month period ending Apr. 30, according to an AP dispatch from New Delhi.

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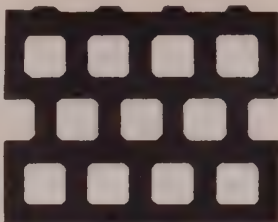
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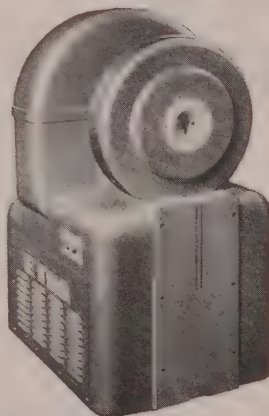
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Lone Star Cuts Iron Price

Dallas—Effective as of Feb. 22, Lone Star Steel Co. lowered its price for No. 2 foundry, low phosphorous southern grade, pig iron \$24.50 a ton to \$50.50 a gross ton, f.o.b. plant, Lone Star, Tex. The company also posted a price of \$50 per gross ton for standard basic grade.

Pig Iron . . .

Pig Iron Prices, Page 128

New York — A number of district foundries are getting caught up on pig iron. In some cases they are actually able to build up a little inventory for the first time in a long while. However, foundries generally are still taking in all the iron that comes their way.

Easing situation in pig iron is due primarily to continued restriction of foundry operations, although freer supply of scrap at substantially reduced prices is also having a bearing.

An inquiry is current from Argentina for 1000 tons of low phosphorus iron. The import market is quiet.

Pittsburgh—Curtailed in output of castings has relieved tight supply situation in coke, pig iron and cast scrap. Some foundry interests report increasing competition from foundries outside this district, necessitating price reductions ranging from 10 to 15 per cent in bidding on new work. Current competition for new business is expected to result in considerable reshuffling of patterns among local jobbing shops. A number of foundries are operating on a 4 day per week schedule. Sharp reduction in pig iron prices put into effect by Lone Star Steel Co. last week will have little, if any, effect on this market.

Philadelphia—A further easing in pig iron supplies is noted, with foundries pressing less actively and with some outside sellers offering tonnage more freely. One Buffalo furnace is offering foundry iron here for the first time in months and another is offering silvery more freely. A Birmingham furnace is offering some small lots after having been out of the market here for many months. Pig iron prices generally are unchanged although the Lone Star, Tex., producer has dropped its price on foundry iron \$24.50 a ton to \$50.50, furnace.

Buffalo — Hopes for a rebound in foundry operations were expressed as melting operations in the local area seemed to be leveling off at curtailed levels. While total iron output continues to move immediately into consuming channels it was noted that an increased volume of iron is moving out of the area. It is hard to estimate an overall cut in local foundries. Many are down to four days a week while some report operations off as high as 60 per cent. Meanwhile, the district pig iron production rate adds to its prolonged stay at 100 per cent of capacity.

Cincinnati—Cutbacks in pig iron are appearing as foundries, on light melt, build up stocks. However, shipments into the district fail to meet

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the overall demand. Probably because of diversions, a little more northern iron, a few carloads above allotments, is finding its way into the district. Expected pickup in the melt is not yet discernible.

Birmingham — Pig iron supplies are as inadequate as ever in this district, even though both major merchant iron makers have withdrawn from distant markets. As has been the case for months, pipe plants can continue to take up the moderate slack occasioned by slowed up foundry activities.

Scrap . . .

Prices drop further in leading districts on continued light buying interest

Scrap Prices, Page 132

Pittsburgh — Scrap quotations continued weak last week with no new buying by major consumers reported. Favorable weather conditions for collection and segregation of scrap, coupled with ample inventory position of mills despite record steel production, have combined to force scrap price levels lower. The end of the decline is not in sight.

A large mill has made commitment to purchase short shovel turnings for \$30 at completion of shipments under old contracts early next month. This represents further reduction of about \$4 a ton in that grade of scrap and establishes turnings with the dubious honor of being the weakest of all classifications. One "crusher" contends supply of turnings far exceeds demand, and has reached the point where this interest has refused to bid on new tonnage offered because of consumers' lack of interest in placing orders. Quotations for machine shop and mixed borings and turnings similarly are said to be off substantially from levels a week to 10 days ago, chiefly on bid quotations of crushers.

Cast scrap grades remain nominal in the absence of new orders placed by foundries. Some foundries have been offered rails, 2 feet and under, at \$50, but refused the same.

New York — Scrap brokers' buying prices continue to sag and, were it not for the necessity of cleaning up some consumer orders before the end of this month, quotations on turnings and certain other grades would likely be still lower. There is little new consumer buying of steel scrap. Brokers' buying prices on No. 1 heavy melting are now \$30, f.o.b. New York shipping point; No. 2 heavy melting, \$28; No. 1 busheling, \$28; No. 1 bundles, \$30; No. 2 bundles, \$28; and No. 3 bundles, \$26. Machine shop turnings and mixed borings and turnings are \$22-\$23; short shovel turnings, \$23-\$24; punching and plate scrap and structurals, \$34-\$35; and electric furnace bundles, \$32-\$33. Cast grades are nominally unchanged.

Philadelphia — Open-hearth steel scrap prices are unchanged, with little business to test the market. However, certain other steel grades have declined, with short shovel turnings now holding at \$32-\$33 delivered, bar crop and plate, punchings and plate scrap and cut structurals at \$41-\$42,



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heavy turnings \$38-\$39, and No. 1 chemical borings \$39-\$40. Cast scrap prices continue to decline. No. 1 cupola is now holding at \$40-\$42 delivered, No. 1 machinery at \$45-\$46, charging box and heavy breakable \$42, clean auto cast \$42, unstripped motor blocks \$37-\$37.50, and No. 1 wheels \$47-\$48.

Buffalo—Recent sharp reductions in scrap prices, were confirmed last week when a mill placed orders for approximately 10,000 tons within prevailing ranges. No. 2 heavy melting and No. 1 bundles were acquired for \$35 a ton. The sale, however, carried a new twist in contracts here when the buyer placed No. 2 bundles at \$32 a ton. Only No. 1 bundles were accepted on the same basis as No. 2 heavy melting.

Dealers were reluctant to predict whether the sale meant that the market was leveling off at these levels. The general feeling seemed to be that weaker tendencies still were in evidence. As a result, the outside figure prevailing on quoted ranges was usually that at which the latest business was reported.

With business in cast items restricted to light foundry buying, the trade was generally guessing on what cupola and machinery cast should bring in the open market. Small tonnages of mixed yard cast were reported moving at \$38-\$40, with some truck lots moving slightly higher.

Detroit—A bad case of the jitters seems to pervade the local market, with no one professing to know just where the price level stands. Until some actual sales are recorded there is no justification for revising quoted prices downward, despite guesses they will be off from \$2 to \$3 per ton. A fair tonnage of turnings was on the market late last week, and one broker said he would not pay over \$22 per ton, against published price of \$24. Mill buying this week should set the pattern for open-hearth grades. Cast scrap market is demoralized with prices marked down \$10 a ton to \$38-\$40. Even the new lower level fails to attract purchasers.

Cincinnati—Scrap prices have been cut in line with isolated sales, lower bids on railroad offerings, and general apathy in the market. Some mills are accepting tonnage, but only at prices below recent levels. Demand for foundry grades is spotty and is especially dull for borings, turnings and malleable.

Chicago—Further weakness in scrap prices developed late last week. Earmarked heavy melting and bundles dropping to a top of \$35. This new level affected most other items on the list, many now being quotable several dollars lower. Latest railroad list for the most part closed at lower prices and bidding interest was light, there being only a limited market for the relatively small tonnage involved. Lack of foundry buying reflects reduced melting level and moderate improvement in pig iron supplies.

Dallas—The scrap market remains inactive with no change in demand or prices. Buying apathy is such that brokers and yards are hesitant to quote price revisions either way from

the norm of the past few weeks. Cast iron remains at an absolute standstill, with supplies ample.

Los Angeles—Mill buyers and dealers believe that domestic and off-shore scrap supplies will be adequate to meet this district's needs in 1949. Local collections are better, improved weather is aiding delivery of out-of-state material, and foreign scrap is now being unloaded in good volume. One mill has received its first consignment of Japanese scrap, a substantial portion being landing mats. Shipments which went to other West Coast plants of this company included Jap helmets and artillery barrels. Prices for steelmaking scrap are holding steady, but No. 1 cupola cast is down \$5 and its undertone is weak.

San Francisco—Prices remain steady at new lower levels established earlier this month. Return of better weather soon promises increased gathering of scrap which, together with incoming material from Pacific Island and Japan, is expected to supply most mills adequately. Mill inventories currently are in good shape.

Seattle—Weather conditions are handicapping land shipments of steel scrap, but mill receipts are more than ample for current consumption. Dealers have accepted the new mill price of \$27.50, a drop of \$2.50, and are shipping as conditions permit. Bethlehem Pacific Coast Steel Corp., expects another full cargo of 9000 or 10,000 tons at the local plant next month. Figures released by the Canadian National Railways reveal that last year the company collected nearly 50,000 tons of scrap in Western Canada, an increase of 17,000 tons over 1947. Bids are in for about 11,000 tons of rails from the Copper River at Northwestern Railway out of Cordova, Alaska. Eleven firms have submitted offers.

Iron Ore . . .

Iron Ore Prices, Page 128

Cleveland—Iron ore freighters are expected to get an early start this spring as a result of the mild winter weather in the Great Lakes region. A survey just made by H. J. Doebler, skipper of the Coast Guard icebreaker Mackinaw, reveals that the only thick ice between Cheboygan, Mich., and this city covers a three-mile stretch of the St. Clair river. Ice in the Straits of Mackinac is the lightest it has been in years, the water being mostly open west of Bois Blanc island at which point an ice bridge spans the straits.

Supplies of ore are ample to maintain the present high rate of operations until the season opens. As of Feb. 1, stocks totaled 31,904,181 tons, equivalent to about four months' needs at the present rate of consumption, compared with 39,460,497 tons a month earlier and 29,081,189 tons a year ago. Of the Feb. 1 total, 4,022,194 tons were on Lake Erie docks and 26,396,528 tons at furnaces in the United States and 1,485,459 tons at furnaces in Canada.

Consumption totaled 7,590,471 tons in January compared with 7,351,069 tons in December and 7,056,667 tons in January, 1948. Of the January consumption, 7,360,143 tons were in

the United States and 230,328 tons in Canada.

During the first two months of this year, 177 furnaces were in blast in the United States and 9 in Canada while those idle totaled 8 and 1, respectively.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 128

Pittsburgh — No significant improvement is noted for beehive foundry coke, reflecting continued lag in castings demand.

Bethlehem Pacific Gets Furnace

NEW 75-ton electric furnace will be added to the steelmaking facilities of Bethlehem Pacific Coast Steel Corp.'s Los Angeles plant, to provide more steel for increased rolling mill operations at Los Angeles.

A 50-ton electric unit was put into operation at Los Angeles over a year ago. The new 75-ton furnace will further increase the steelmaking capacity of that plant to about three times its output capacity at the end of the war.

Canada . . .

Toronto, Ont.—Iron and steel production in Canada for 1948 was at the highest rate in history.

Pig iron output totaled 2,120,909 net tons in 1948, or 151,062 tons greater than the previous record made in 1947. Output of ferroalloys also topped all former records at 250,659 net tons and compares with the previous record of 186,978 tons for 1945.

Production of steel ingots and castings for 1948 reached the record total of 3,201,656 net tons compared with the previous record of 3,024,978 tons made in 1944.

For December, pig iron production amounted to 174,233 net tons, or 74.7 per cent of capacity, and included 145,806 tons of basic iron, 11,832 tons of foundry iron and 16,595 tons of malleable iron. Output of ferroalloys amounted to 23,708 net tons in December.

Production of steel ingots and castings totaled 280,425 net tons, or 87 per cent of capacity.

Following are comparative production figures in net tons:

	Steel Ingots Castings	Pig Iron	Ferro- alloys
Dec., 1948 . . .	280,425	174,233	23,708
Nov., 1948 . . .	277,978	166,771	17,594
Dec., 1947 . . .	249,769	165,551	10,888
Year, 1948 . . .	3,201,656	2,120,909	250,659
Year, 1947 . . .	2,945,166	1,969,847	149,832
Year, 1946 . . .	2,334,631	1,403,758	116,995

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325 tons, coal handling plant, C. H. Sprague Co., Cambridge, Mass., to A. O. Wilson Structural Co., Cambridge.

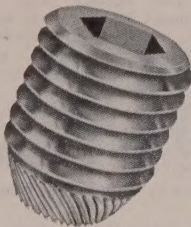
300 tons, 2-story garage, 11th Ave. and 49th St., New York, to Grand Iron Works Inc., that city.

300 tons, gravel bunker at Hungry Horse,

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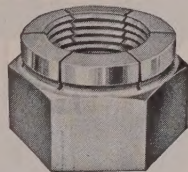
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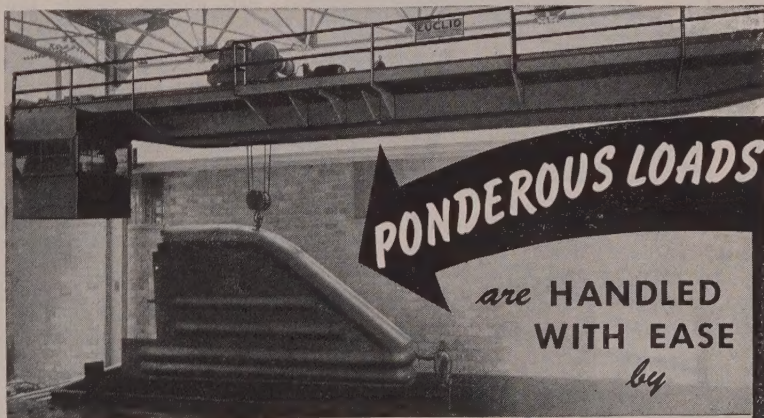
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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

LOS ANGELES—Southern California Edison Co., 601 W. Fifth St., has awarded a \$19,406,500 contract for a powerhouse on San Joaquin river to Bechtel Corp., 220 Montgomery St., and Morrison-Knudsen Co., Crocker First National Bank Bldg., San Francisco.

WILMINGTON, CALIF.—Contract for \$954,160 has been awarded to Curlett Construction Co., Long Beach, Calif., for construction of a two-story harbor transit shed.

FLORIDA

MIAMI, FLA.—Seaboard Airline Railway, c/o contractor, has awarded a \$100,000 contract for construction of a warehouse to Halsema Bros., 1254 N. W. 74th St.

GEORGIA

ATLANTA—Chrysler Corp., c/o Robert & Co. Inc., architect, 96 Poplar St., has awarded a \$1 million contract to Virginia Engineering Co., Newport News, Va., for construction of a motor parts manufacturing plant.

ILLINOIS

CHICAGO—Atlantic Brass Works, 2600 W. Addison St., will build a \$600,000 plant; Bertrand Goldberg, 721 N. Michigan St., architect.

EAST ST. LOUIS, ILL.—Soya Feed & Oil Corp., 422 S. Front St., has awarded a \$800,000 contract for a plant to Chemical Plants Division of Blaw-Knox Co., 321 Pennsylvania Ave., Pittsburgh.

KANSAS

TOPEKA, KANS.—Union Pacific Railroad, 1416 Dodge St., Omaha, Nebr., has awarded a \$200,000 contract to Dugdale Construction Co., Topeka, for erection of a warehouse.

LOUISIANA

SHREVEPORT, LA.—Bird Roofing Co., c/o contractor, has awarded a \$1 million contract to Rust Engineering Co., Clark Bldg., Pittsburgh, for construction of a felt mill addition.

MARYLAND

BALTIMORE—Truscon Steel Co., Youngstown, has plans completed for construction of a \$250,000 warehouse and sales office building, 4600 E. Monument St.; A. J. Klinkhart, architect.

BALTIMORE—Harbison-Walker Refractories Co., Patabasco Ave., is building a plant addition to be used for storage of finished products. The company began operation of its \$2 million plant here last year, and still has work under way on a second tunnel kiln.

DUNDALK, MD.—Consolidated Gas & Electric Light & Power Co., Lexington Bldg., Baltimore, has awarded \$1,268,000 separate contracts for erection of a generating station.

MINNESOTA

MINNEAPOLIS—Northern States Power Co., 15 S. Fifth St., will build a \$1.2 million power house, 2832-2910 Marshall St., N. E. Owner builds. J. A. York, c/o owner, architect.

MISSOURI

ST. LOUIS—Hadley Bros. Uhl Co., 3952 W. Pine St., has awarded a \$100,000 contract to V & M Contracting Co., 4030 Chouteau Ave., for construction of a plant; John A. Grunik, 6635 Delmar Blvd., architect.

NEW JERSEY

CLIFTON, N. J.—Allen B. DuMont Laboratories Inc., 2 Main Ave., Passaic, N. J., has awarded a \$500,000 contract to Wenly Bros. & Storms Co., McLean Blvd. and Ninth Ave., Paterson, N. J., for construction of a tube plant; Peter Holley, 195 Van Houten St., Paterson, architect, Jacoby-McGroun

Mont., to Isaacson Iron Works, Seattle; General-Shea-Morrison, general contractors. 250 tons, grain conveyer gallery, Hoosac Pier, Boston, to Grossier & Shlager Iron Works, Somerville, Mass.

STRUCTURAL STEEL PENDING

2500 tons, structures and penstocks, Detroit dam, Oregon; bids in to U. S. Engineer, Portland, Oreg.

950 tons, elevated busway lane, Boston Transit Department, Boston; J. H. Singarella Co., Boston, low on general contract.

700 tons, warehouse, Philadelphia, Barclay-White Co., contractors, that city; bids closed.

450 tons, enameling plant, Kaiser Fleetwing Inc., Bristol, Pa.; pending.

450 tons, warehouse, Owens-Illinois Glass Co., Toledo, O.; bids in.

400 tons, community hospital, Sunbury, Pa.; bids asked.

175 tons, pony truss bridge, Ayer, Mass.; D'Onofaro & Son, Boston, low on general contract.

130 tons, masts, New York Shipbuilding Corp., Camden, N. J.; pending.

125 tons, hospital, Honesdale, Pa.; pending.

Unstated, engineering shop building; bids to Seattle Mar. 9.

Unstated, 1100-foot Montana state Yellow-stone river bridge, also railroad overpass; bids to Helena, late March.

REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons, miscellaneous small jobs, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, grain elevator eastern Washington, to Northwest Steel Rolling Mills Inc., Seattle; Central Construction Co., Spokane, general contract.

REINFORCING BARS PENDING

165 tons, state overpass, Spokane county, Washington; bids to Olympia, Mar. 4.

155 tons, Washington state Spokane river bridge; bids to Olympia, Mar. 4.

450 tons, junior high school, Seattle; J. G. Watts Construction Co. and S. Birch & Sons, Seattle, joint low bid, \$1,545,000.

Unstated Montana state highway projects, Yellowstone and Smith rivers; bids to Helena, late March.

Unstated, Oregon state highway projects, Columbia, Benton and Douglas counties; bids to Portland, Oreg., Feb. 28 and Mar. 1

PLATES . . .

PLATES PLACED

1600 tons, straight web and standard T sheet piling, to Bethlehem Pacific Coast Steel Corp., Seattle, by U. S. Engineer for McNary dam.

PLATES PENDING

1500 tons, estimated two 7,750,000-gallon steel reservoirs, Atomic Energy Commission, Los Alamos, N. Mex., Chicago Bridge & Iron Co., Tulsa, Okla., low

400 tons, 28 inch steel water pipe for Bremerton, Wash.; American Pipe & Construction Co., Portland, Oreg., low.

Unstated, 18 inch steel water intake; bids to N. C. Wise, city clerk, Chelan, Wash., Feb. 25.

PIPE . . .

CAST IRON PIPE PLACED

130 tons, 12 inch and larger, by Vancouver, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago & Northwestern, 1000 box cars, to Pullman-Standard Car Mfg. Co., Chicago.



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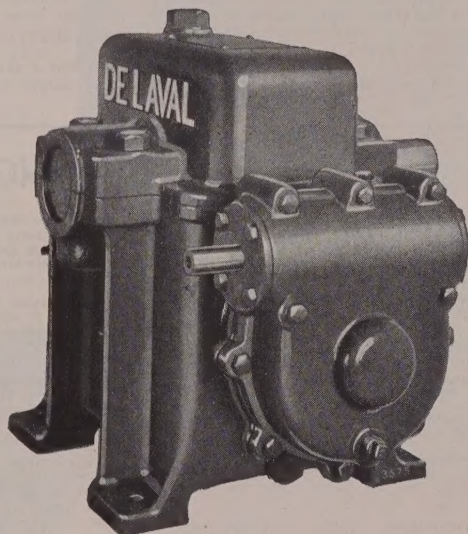
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& Co., 195 Van Houten St., Paterson, engineer.

NEW YORK

NEW YORK—George A. Fuller Co. has awarded a \$600,000 contract to General Bronze Corp. to furnish windows, spandrels and trim for a building under construction at 100 Park Ave.

NEW YORK—New York Journal of Commerce, 63 Park Row, will build a \$650,000 publishing plant at 99-103 Worth St.; William Ginsberg, 351 Madison Ave., architect.

OHIO

CLEVELAND—Machine & Drop Forge plant of the Champion Machine & Forging Co., 3695 E. 78th St., is being offered for sale or lease by WAA. The plant consists of an office and machine shop building and transformer building, etc. Equipment includes machines, metal-forming and sheet metal tools with accessory equipment necessary for large machining and drop forging operations. Bids will be received by the Office of Real Property Disposal, 704 Race St., Cincinnati, until Apr. 15, 1949.

HOMEWORTH, O.—Model Drill & Tool Co.

has been chartered through George Sanor to manufacture and deal in drills, tools, etc. Incorporators are Cecil R. Brack, Charles B. Allman and Mr. Sanor.

STUEBENVILLE, O. — Commercial Steel Corp. has been formed to deal in iron, steel and other metals, also to manufacture articles and materials. Incorporators are Roman Bierzynski, Frank W. Cook and Tyler O. Cook, also agent, 528 Dock St.

OREGON

PORTLAND, OREG.—Messall Bag Co., 105 S. E. Hawthorne St., has awarded a \$100,000 contract to S. P. Lonner, 5330 S. E. Belmont St., for construction of a warehouse; Ernst Kroner, 314 S. E. 13th St., architect.

PENNSYLVANIA

NEVILLE ISLAND, PA. — Chaplin Fulton Mfg. Co., 38 Penn Ave., Pittsburgh, will build a \$150,000 steel manufacturing building; Franklin Doudon & Associates, 522 Century Bldg., Pittsburgh, architect.

WEST MIFFLIN, PA.—Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, has awarded a \$150,000 contract to Mountaineer Engineering Co., 507 Boulevard of Allies,

Pittsburgh, for construction of an atomic research plant for marine power.

SOUTH CAROLINA

GRANITEVILLE, S. C.—Graniteville Mills has awarded a contract estimated at over \$100,000 to Daniel Construction Co., Greenville, S. C., for construction of a bleachery.

TEXAS

HOUSTON, TEX. — San Jacinto Ammonium Works, c/o San Jacinto Ordnance Department, has awarded a \$115,000 contract to Pfeiffer Electric Co., La Porte, Tex., construction of a plant, and a \$190,000 contract to Tellepsen Construction Co., 390 Clay St., for constructing railway track in ammonia plant and depot zone.

MINERAL WELLS, TEX.—Brazos River Ge Co. plans a \$475,000 absorption plant; Robert L. Purvin and R. Henry, Constructive Bldg., Dallas, engineer.

CUBA

HAVANA, CUBA—Municipality of Havana has received only one bid, from Gonzalez d Valle, for \$26 million water supply addition.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Continued from Page 129)

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90c; ton lots 21.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.5c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices. **90-95% Ferrosilicon:** Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Odd 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.). C.I., lump, bulk, regular 19.0c per lb of Si c.i. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsilfer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis b.i.b. Niagara Falls, N. Y., lump, carload, bulk, 8.90c per lb of alloy, ton lots packed 10.3c, 200 to 1999 lb 10.65c, smaller lots 11.15c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr.). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.i. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.i. bulk 10.0c, per lb of briquet, c.i. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.i. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.i. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdenum-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots, 2" x D, \$1.40 per lb of contained Ti; less ton \$1.45. (Ti 38-43%, Al 3% max., Si 4% max., C 0.10% max.). Ton lot \$1.28, less ton \$1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, \$160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: Ti 17-21%, C 3-4.5%). Contract, \$175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 3-12% max., C 3-3.5% max.). Contract, any quantity, \$2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), \$3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), \$3.10.

Vanadium Oxide: Contract, less carload lots, \$1.20 per lb of contained V₂O₅, freight allowed. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c, freight allowed.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W. or more, \$2.25 per lb of contained W; 2000 lb W to 10,000 lb W, \$2.35; less than 2000 lb W, \$2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, \$2.90 per lb of contained W; less than 1000 lb W, \$3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.i., lump, bulk 6.6c per lb of alloy, c.i. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 4-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max. Al 0.50% max., C 0.50% max.). Contract 100 lb or more, 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered, Spot add 5c.

Borasil: (3 to 4% B, 40 to 45% Si), \$6.25 per lb contained B, f.o.b. Philo, O., freight exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60% Mn 5% max. Si 8% max., C 0.5% max.). Contract, ton lot 2" x D, \$2.90 per lb of contained Cb, less ton \$2.95. Delivered. Spot, add 25c.

CMZ Mixes: (No. 4—Cr 45-49%, Mn 4-6% Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5 Cr. 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.7-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8% Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Contract, 100 lb or more, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% Fe 20% approx.). Contract, carload, packed 1½" x 12 M, 16.5c per lb of alloy, ton lot 17.25c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidex No. 4: (Si 48-52%, Ca 5-7%, Ti 11%). C.I. packed, 16.50-17.00c per lb of alloy, ton lots 17.90-18.00c; less ton lots 19.40-19.50c. f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19% Mn 3-11%). C.I. packed, 14.25c per lb alloy; ton lots 15.75c; less ton lots 17.0c. f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c smaller lots 11.75c per lb alloy; freight exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of \$3 for each 1% of above or below the base): Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, Sigo, Tenn.; \$65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity \$1.10.

Technical Molybdenum-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., packed in bags containing 20 lb of molybdenum, 86.00c.